ZB-2570/2571/2570P/2571P User Manual

Warranty

All products manufactured by ICP DAS are warranted against defective materials for a period of one year from the date of delivery to the original purchaser.

Warning

ICP DAS assumes no liability for damages consequent to the use of this product. ICP DAS reserves the right to change this manual at any time without notice. The information furnished by ICP DAS is believed to be accurate and reliable. However, no responsibility is assumed by ICP DAS for its use, or for any infringements of patents or other rights of third parties resulting from its use.

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1. Introduction

ZigBee Network

The ZB-2570/2570P is a host ZigBee converter, and the ZB-2571/2571P is a slave ZigBee converter. Each feature an Ethernet/RS-485/RS-232 interface. Devices that have an Ethernet/RS-485/RS-232 interface are also able to be connected using the ZB-2570/2570P/2571/2571P. By distributing host and slave ZigBee converters in the field, users can easily build a wireless network that can be used for both monitoring and control.

User-friendly interface

A Windows compatible GUI configuration utility is available. Only four steps are required to set the ZB-2570/2571/2570P/2571P and then it is ready for use. The utility allows users to set different operating modes based on the type of application, and several of the required ZigBee variables such as PAN ID, etc.

What are the benefits of using ZigBee?

ZigBee is a specification based on the IEEE 802.15.4 standard for wireless personal area networks (WPANs). It is targeted at applications that require secure networking as well as high flexibility for network expansion anytime new nodes are to be added. It is also widely used in the industrial control field, in hospitals, labs and in building automation. Three topologies are defined in the IEEE 802.15.4 standard: Star, Cluster Tree and Mesh. The typical transmission range for the 2570/2571 is 100 m, and the 2570P/2571P is 700 m.

At present, the ICP DAS ZigBee converter products, support RS-232, RS-485 and Ethernet interfaces. The main design goal is limited data communication using wireless transmission, so may provide a better solution for environments where wiring is difficult. The ZigBee converter module provides six operating modes. Refer to Section 4.2 for details. The ZB-2570/2571/2570P/2571P includes a repeater module (ZB-2510/2510P) that can be used to increase communication range or prevent data loss if the connection is interrupted or becomes unstable.

2. Specifications

Features:

- ISM 2.4 GHz Operating Frequency.
- Full Compliance with 2.4 G IEEE802.15.4/ZigBee Specifications.
- Wireless transmission range up to 100 m (LOS) (ZB-2570/2571)
- Wireless transmission range range typical for 700 meters, up to 1 km (LOS) (ZB-2570P/2571P)
- GUI Configuration Software (Windows Version)
- DIN-Rail Mountable.

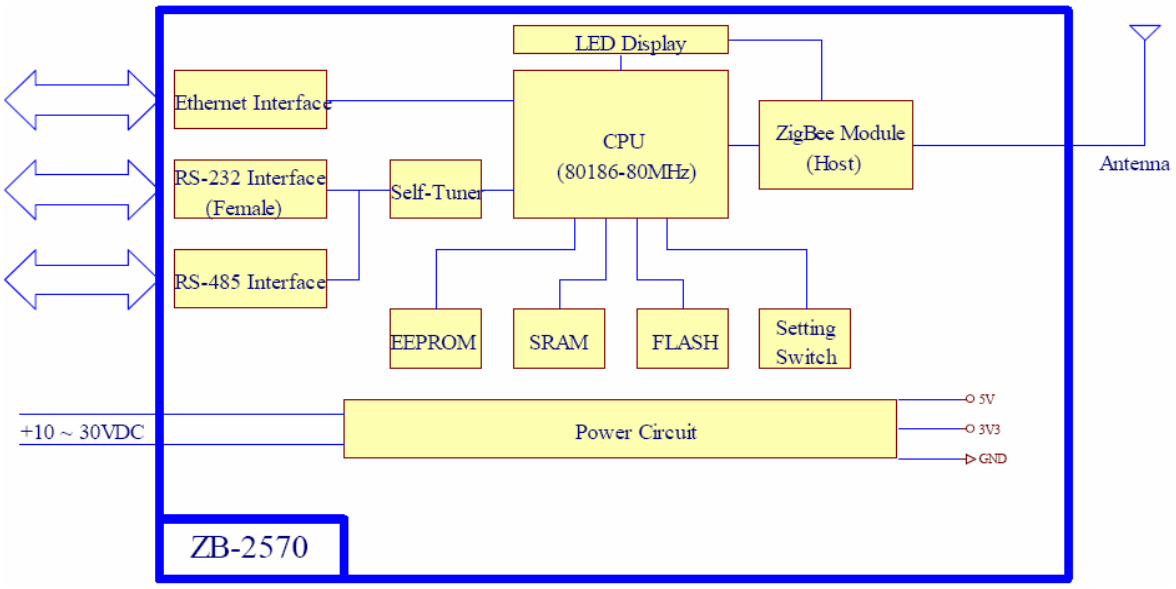
Specifications:

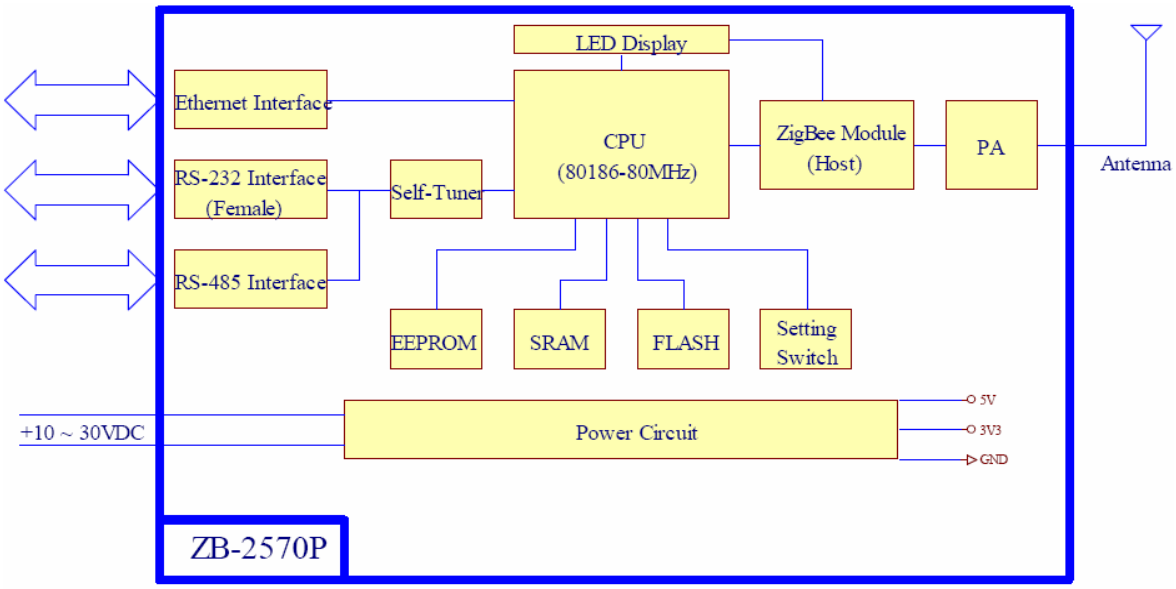
Modules	ZB-2570	ZB-2570P	ZB-2571	ZB-2571P
Wireless				
RF Channels	16			
Receive Sensitivity	-102 dBm			
Transmit Power	12 dBm	18 ~24 dBm, adjustable	12 dBm	18 ~24 dBm, adjustable
Network Topology	Star, Mesh and Cluster tree			
Certification	TUV (ZCP)			
Antenna (2.4 GHz)	3 dBi Omni-directional antenna	5 dBi Omni-directional antenna	3 dBi Omni-directional antenna	5 dBi Omni-directional antenna
Transmission Range	100 m (LOS)	Typical for 700 meters, up to 1 km (LOS)	100 m (LOS)	Typical for 700 meters, up to 1 km (LOS)
General				
CPU	80186, 80 MHz or compatible			
Module Type	Host		Slave	
Communication Interface				
COM 0	RS-232 (TxD, RxD, and GND); D-Sub 9 Female, Non-isolated.		RS-232 (TxD, RxD, and GND); D-Sub 9 Male, Non-isolated.	
	RS-485 (D+, D-; internal Self-Tuner ASIC); Non-isolated.			
Ethernet	10/100 Base-TX (Auto-negotiating, auto_MDI/MDI-X, LED indicators)			
COM 0 Settings				
Baud Rate	1200~115200 bps			
Data Bit	7, 8			
Parity Check	Even, Odd, None			
Stop Bit	1			
LED Indicators				
ZigBee Net State	Green			
ZigBee RxD	Yellow			
Power	Red			
Power				
Protection	Power reverse polarity protection.			
EMS Protection	ESD, Surge, EFT			
Required Supply Voltage	+10 V_{DC} ~ +30 V_{DC}			
Power Consumption	2.5 W	4 W (max.)	2.5 W	4 W (max.)
Connection	5-pin 5.08 mm Removable Terminal Block.			
Mechanical				
Casing	Plastic			
Flammability	UL 94V-0 materials			
Dimensions (W × L × H)	33 mm × 78 mm × 107 mm			
Installation	DIN-Rail			
Environment				
Operating Temperature	-25 ℃ ~ +75 ℃			
Storage Temperature	-40 ℃ ~ +80 ℃			
Relative Humidity	5 ~ 95 % RH, non-condensing			

3. Product Description

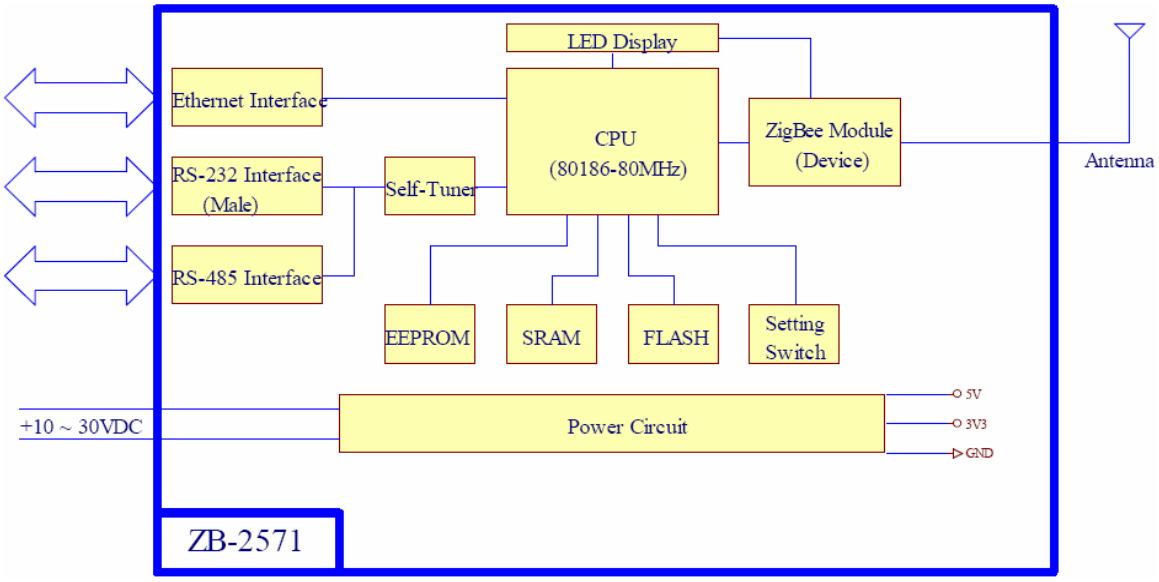
3.1 Internal I/O Structure

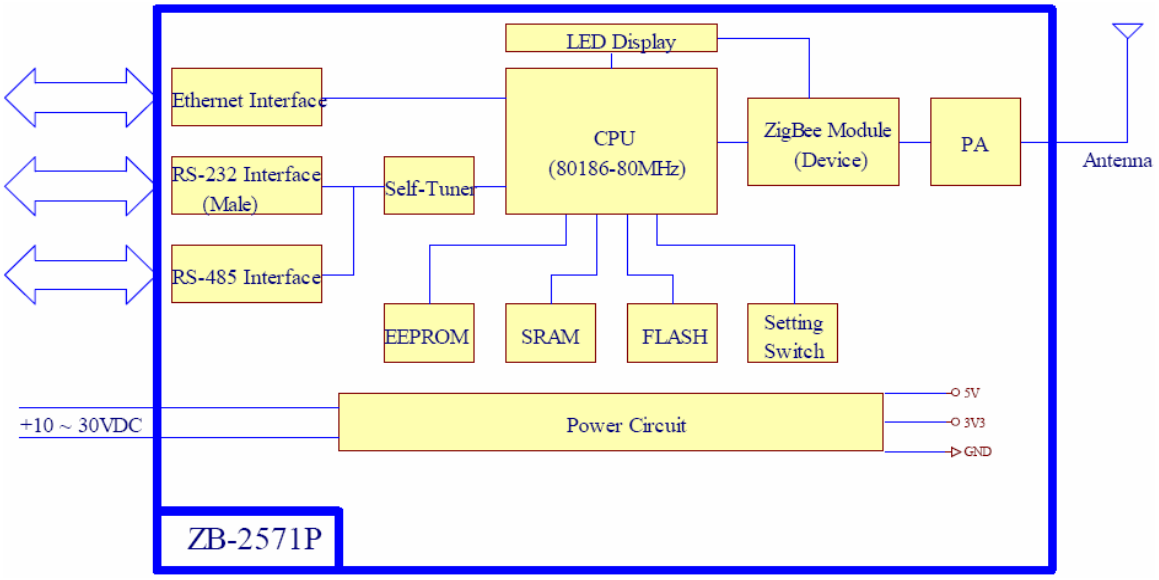
ZB-2570/2570P



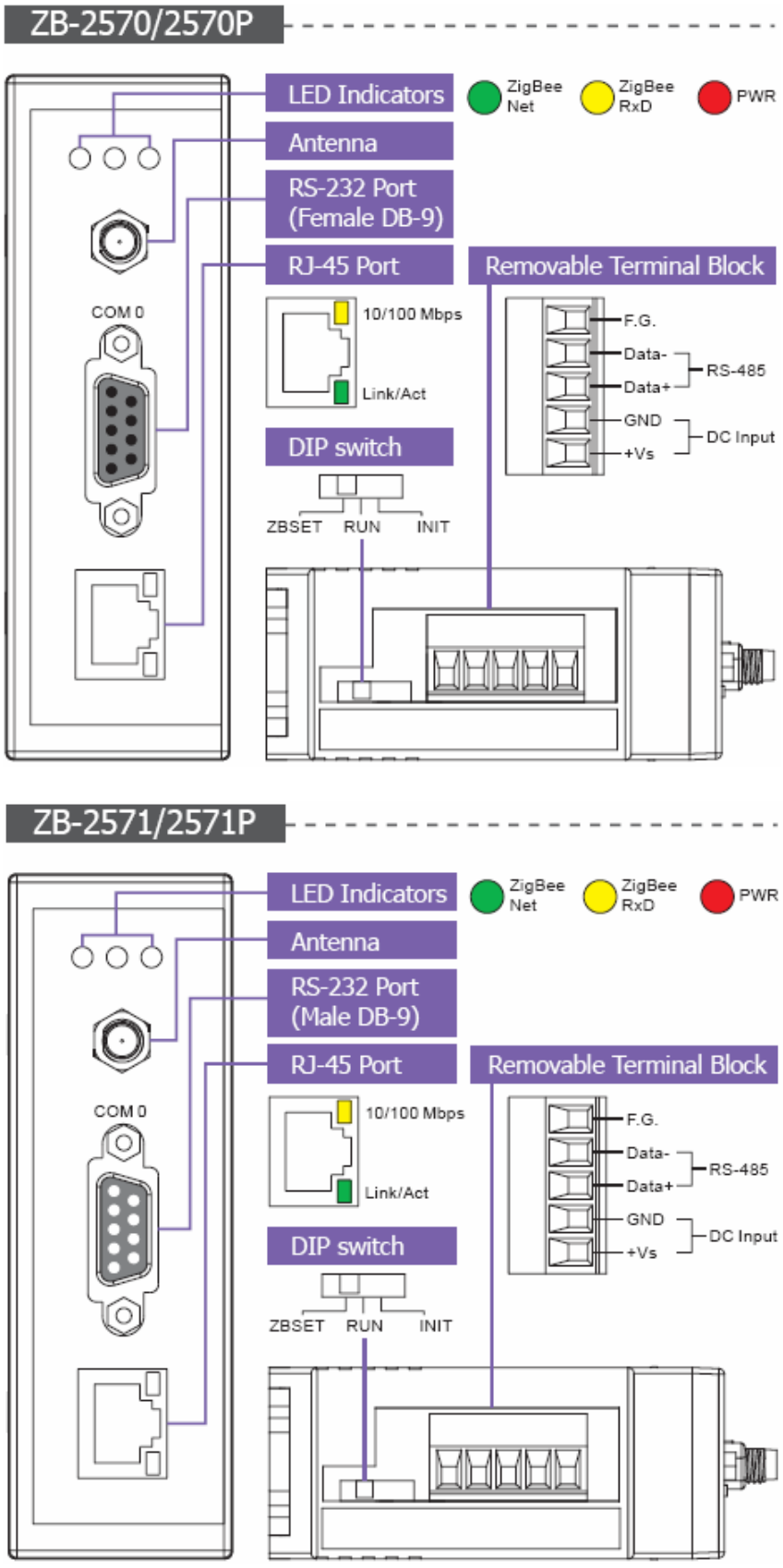


ZB-2571/2571P

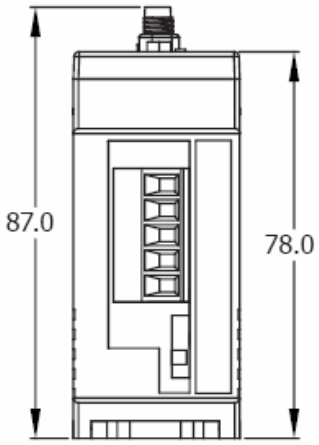




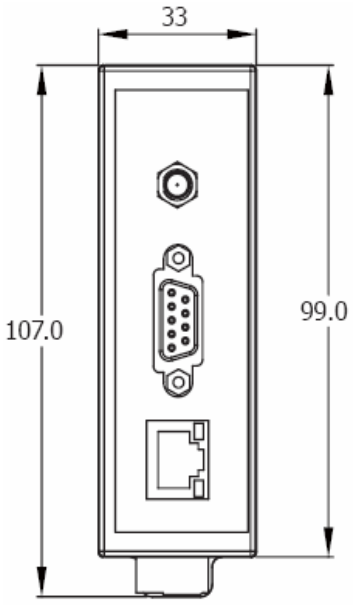
3.2 Appearance



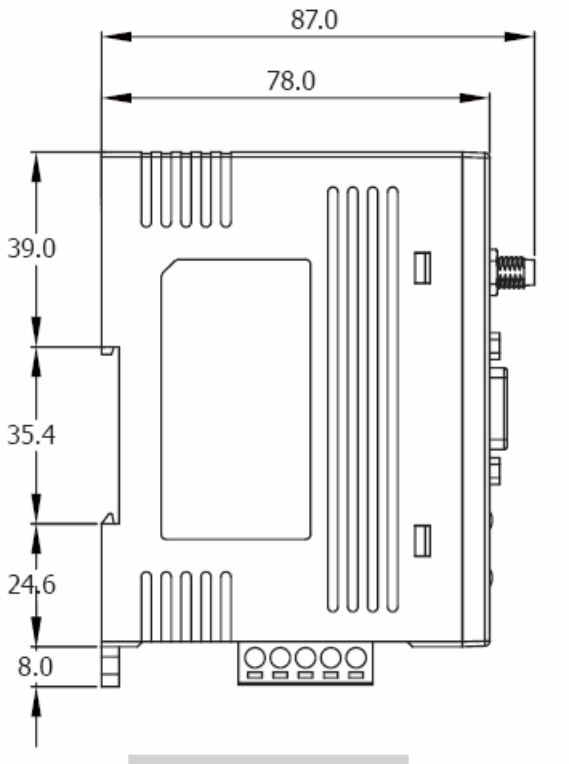
3.3 Dimensions (Units: mm)



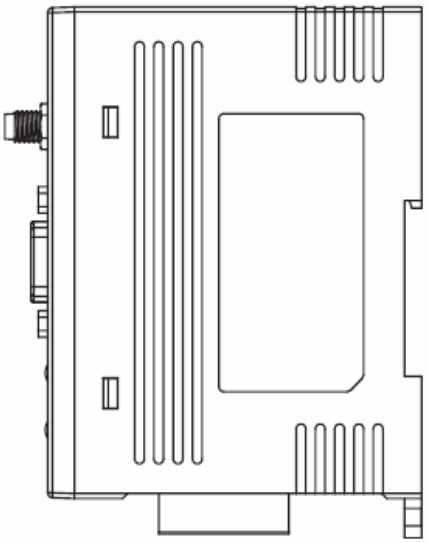
Bottom View



Front View



Left Side View



Right Side View

4. Applications

4.1 Operating Modes

Interface	Operating Modes	
Serial Port (RS-232/RS-485)	Operating Mode 1	Transparent non-addressable Refer to Serial Port Mode 1
	Operating Mode 2	Modbus RTU/ASCII Refer to Serial Port Mode 2
	Operating Mode 3	Transparent addressable Refer to Serial Port Mode 3

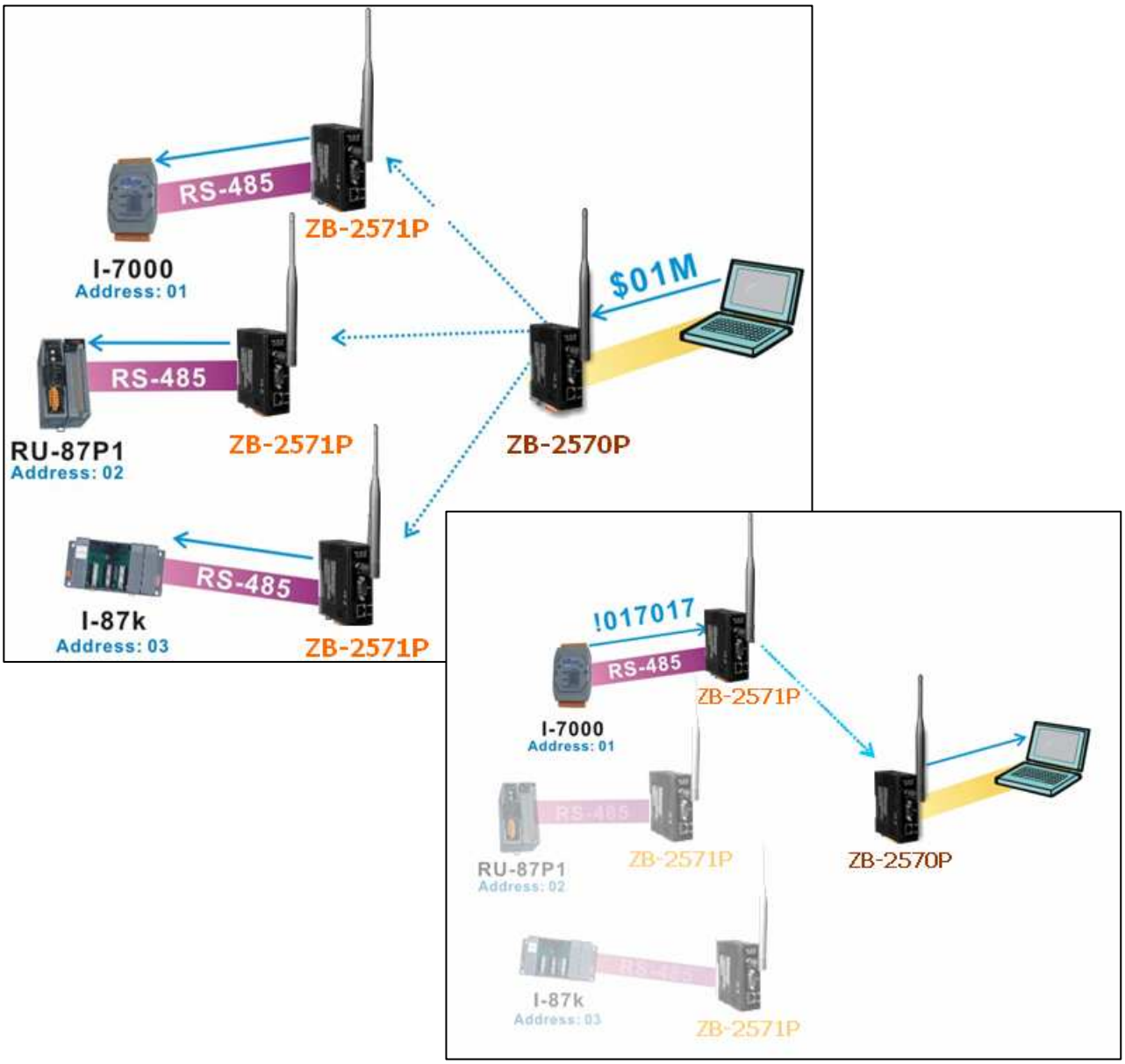
Interface	Operating Modes	
Ethernet (RJ-45)	Operating Mode 1	Transparent non-addressable Refer to Ethernet Mode 1
	Operating Mode 2	Modbus TCP Refer to Ethernet Mode 2
	Operating Mode 3	Transparent addressable Refer to Ethernet Mode 3

*R*efer to Chapter 5 for further details regarding setting arguments.

4.2 Application Example

1. Serial Port Operating Mode 1:

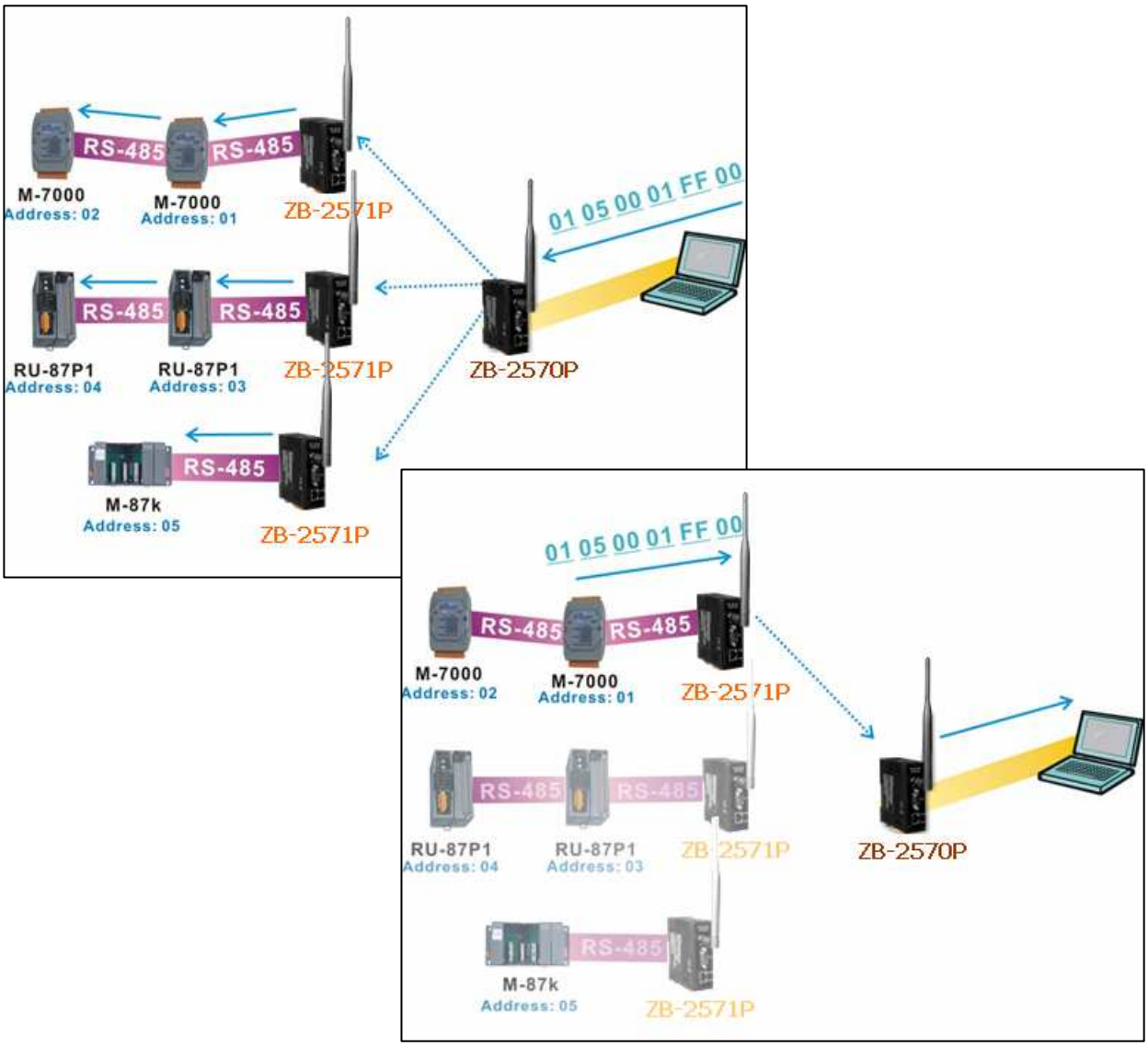
If you wish to convert the RS-232/RS-485 interface to ZigBee and the device is addressable, such as the ICP DAS I-7000/M-7000/I-87k remote I/O modules, you can use the ZB-2571/2571P (slave) to connect to these I/O modules and use the ZB-2570/2570P (host) to connect to your controller or PC.



In some applications where the host controller needs to broadcast data to all RS-232/RS-485 devices, and these devices receive data only (no response), you can also use this mode.

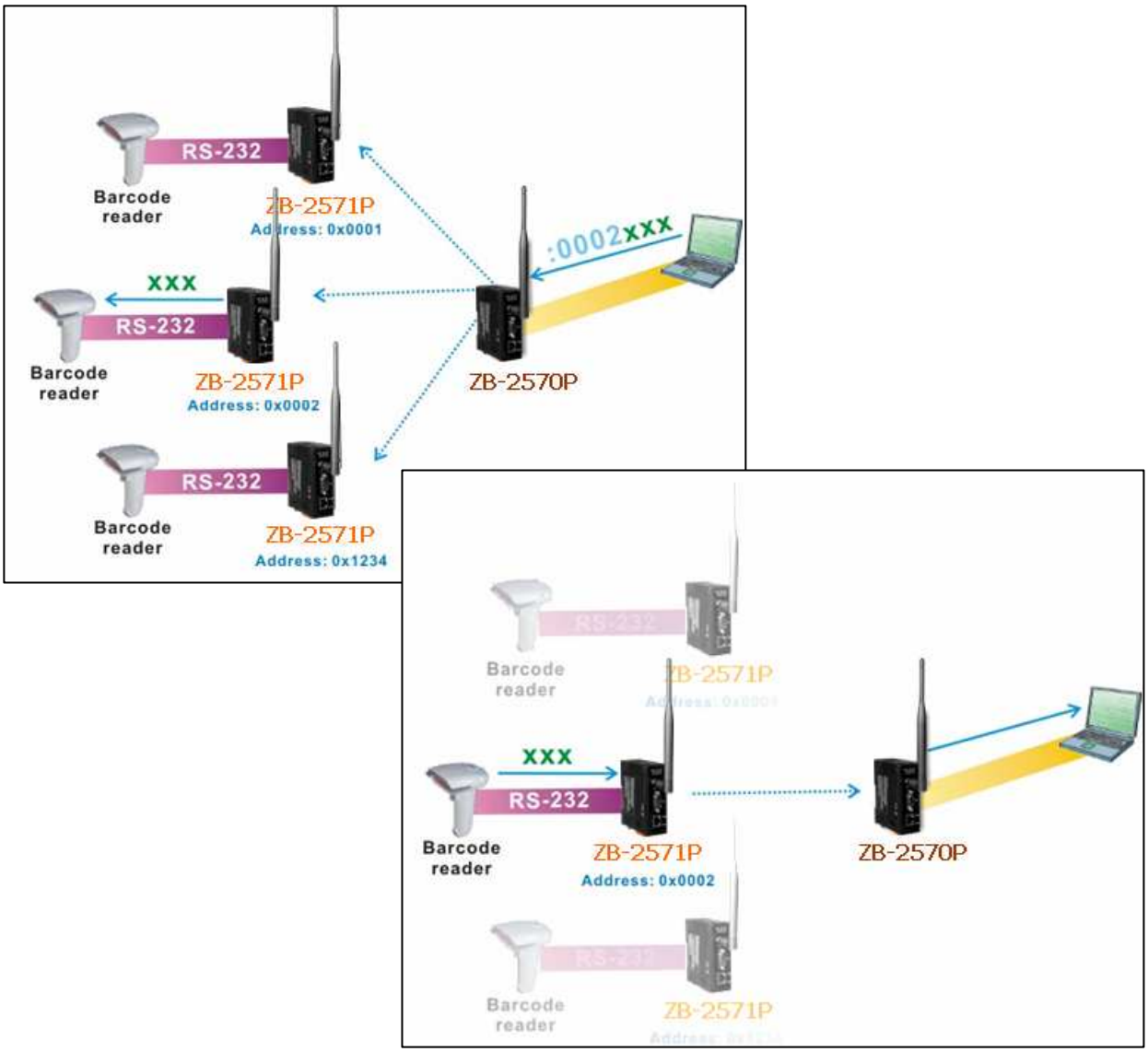
2. Serial Port Operating Mode 2:

This is a specific mode for Modbus RTU/ASCII devices.



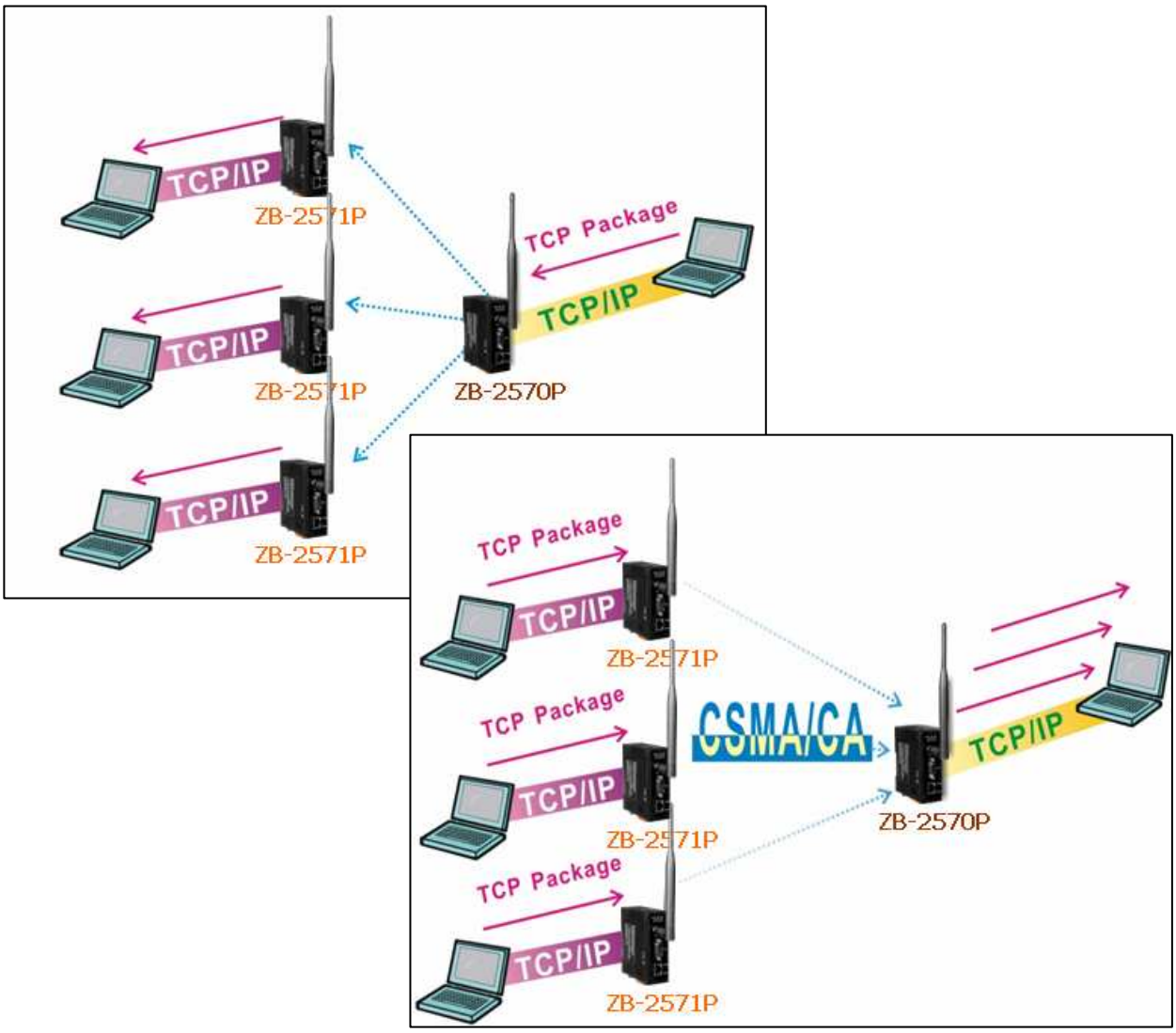
3. Serial Port Operating Mode 3:

If the RS-232/RS-485 interface modules aren't addressable, you can use mode 3 to set an address for the ZB-2571/2571P ranging from 1~0xFFFF (the ZB-2570/2570P is always set as 0). Add 5 ASCII characters to the header of the original request data from your controller, then the remote device with the correct address will respond to it. This mode is similar to that used in ICP DAS I-752N products.



4. Ethernet Operating Mode 1:

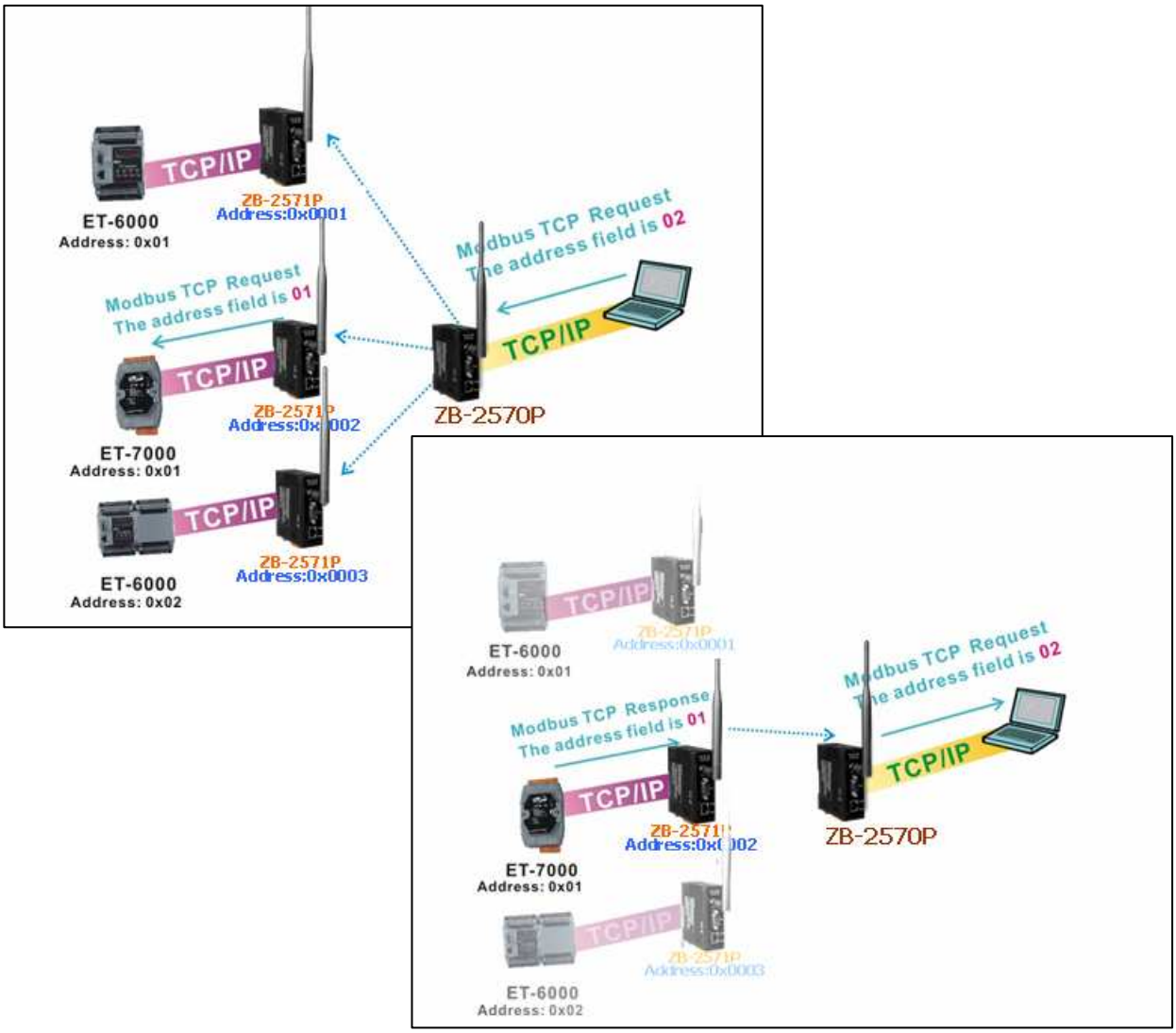
This mode is similar to serial port operating mode 1, but is used to connect to Ethernet devices. You should create a socket using the ZB-2570/2570P instead of a remote device on the controller side. The ZB-2571/2571P will create a socket connection to the rear device (you should set the connection IP and port number via our utility software before you use it.). When the controller sends a TCP package to the ZB-2570/2570P, the ZB-2570/2570P will broadcast it. When the ZB-2571/2571P receives the data from the ZB-2570/2570P, it will forward it to the rear device. If the device responds to the data, the ZB-2571/2571P will only send the TCP package to the ZB-2570/2570P. Your controller will then receive the data that is forwarded from the ZB-2570/2570P.



5. Ethernet Operating Mode 2:

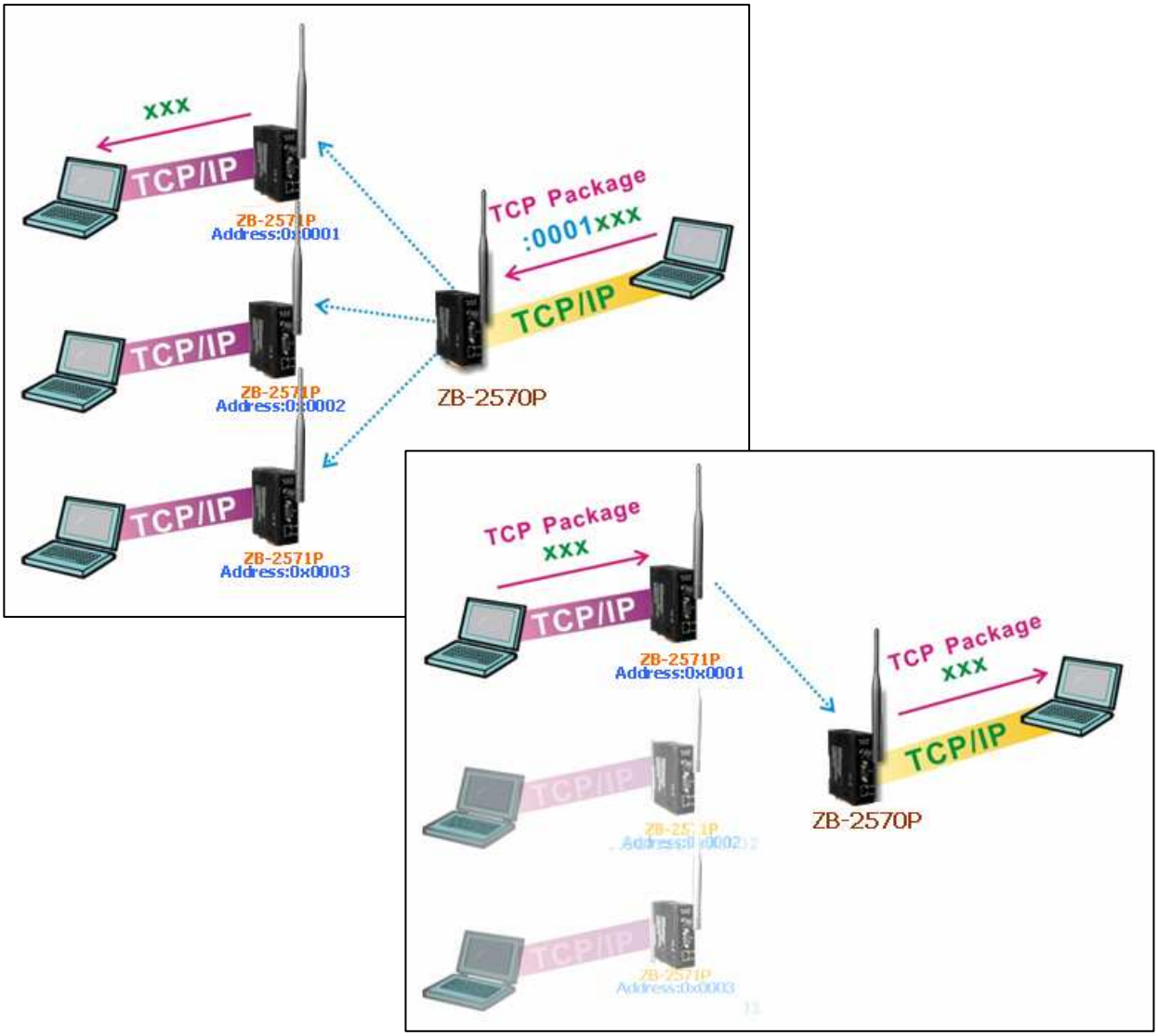
This is a specific mode for Modbus TCP devices. You should set a mapping address to the Modbus TCP device in the ZB-2571/2571P via our utility software, then Modbus TCP request commands can be sent from your SCADA software or your own software via the ZB-2570/2570P. The device with the correct address will then respond to the command.

For example, if the default address of your Modbus TCP device is 1 and you set the mapping address of the ZB-2571/2571P to address 2, you should send a Modbus TCP request command from your software with the address field set as 02.



6. Ethernet Operating Mode 3:

This mode is similar to serial port operating mode 3, but is used to connect to Ethernet devices.

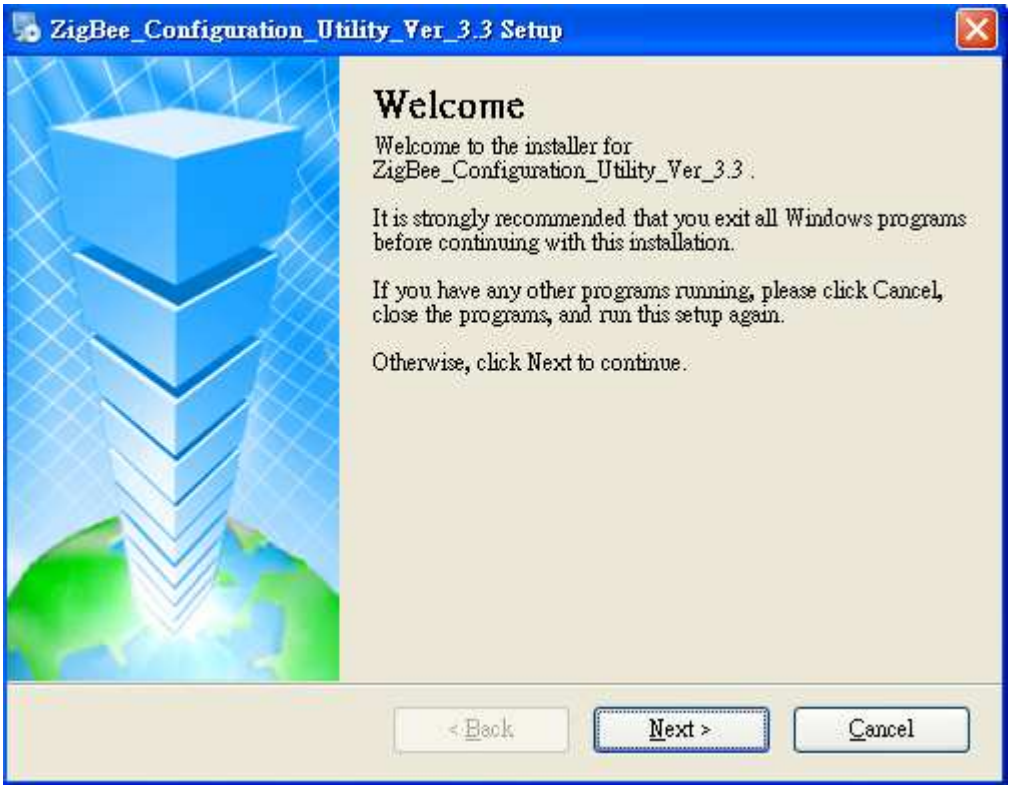


5. Quick Start for the ZB-2570/2571/2570P/2571P

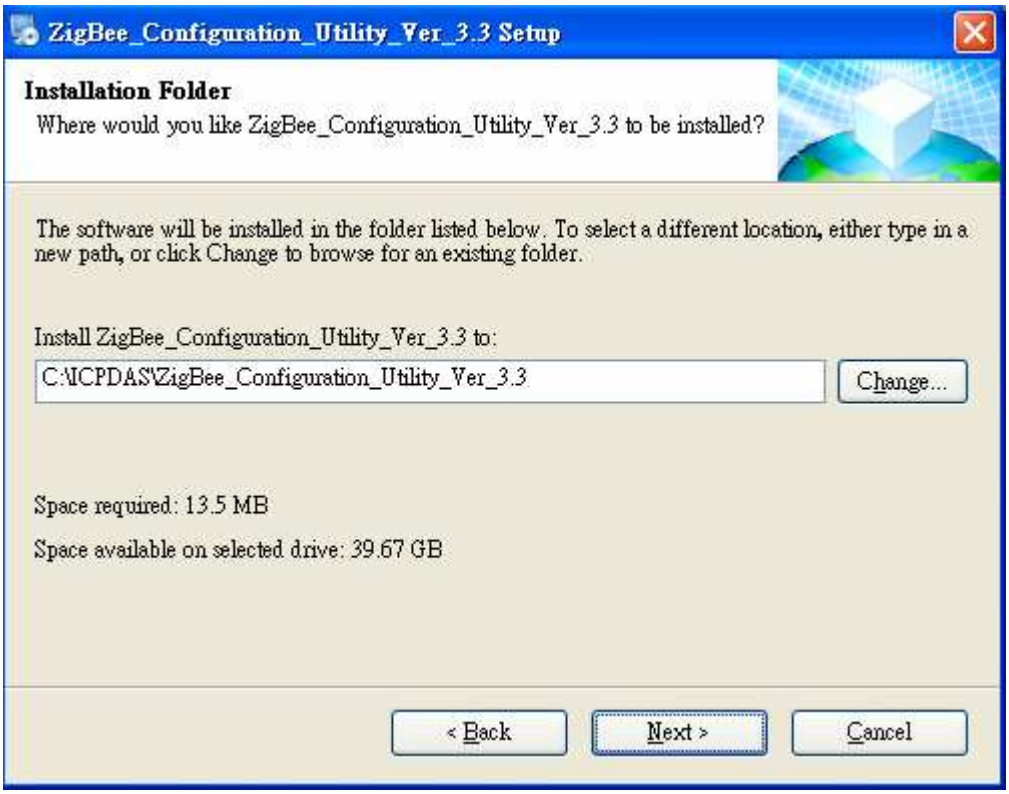
5.1 Installing the Configuration Tool

1. Download the file from:
   http://ftp.icpdas.com/pub/cd/usbcd/napdos/zigbee/zigbee_converter/zb_257x/utility/
2. Uncompress the file and double click the **setup_ver_3.3.exe** file to install the configuration tool for the ZigBee converter.

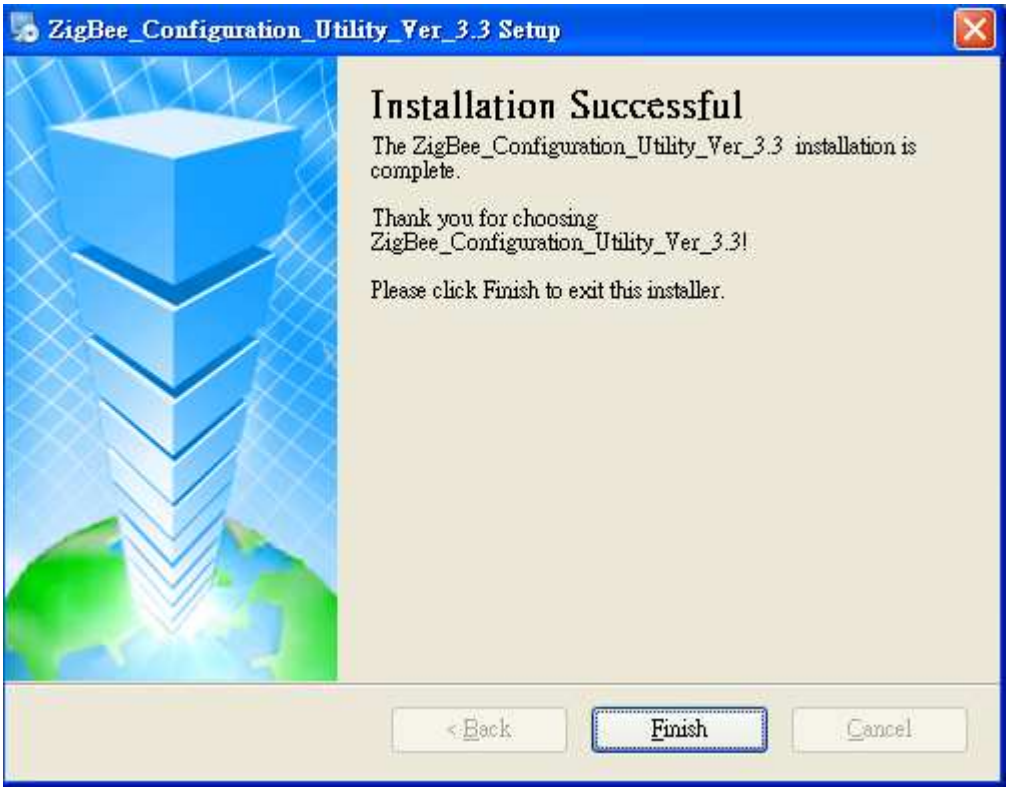
3. When the following screen is displayed, click the **Next>** button to continue the installation, or click **Cancel** exit the installation.



4. When the following screen is displayed, either click the **Next>** button to install the software into the default directory, or click the **Change...** button to install into an alternate location. Click the **Cancel** button to quit the installation.

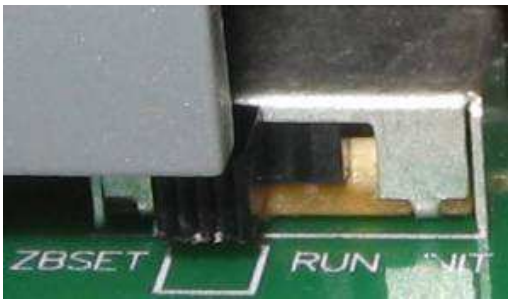


5. When the following screen is displayed, click the **Finish** button to finalize the software installation.

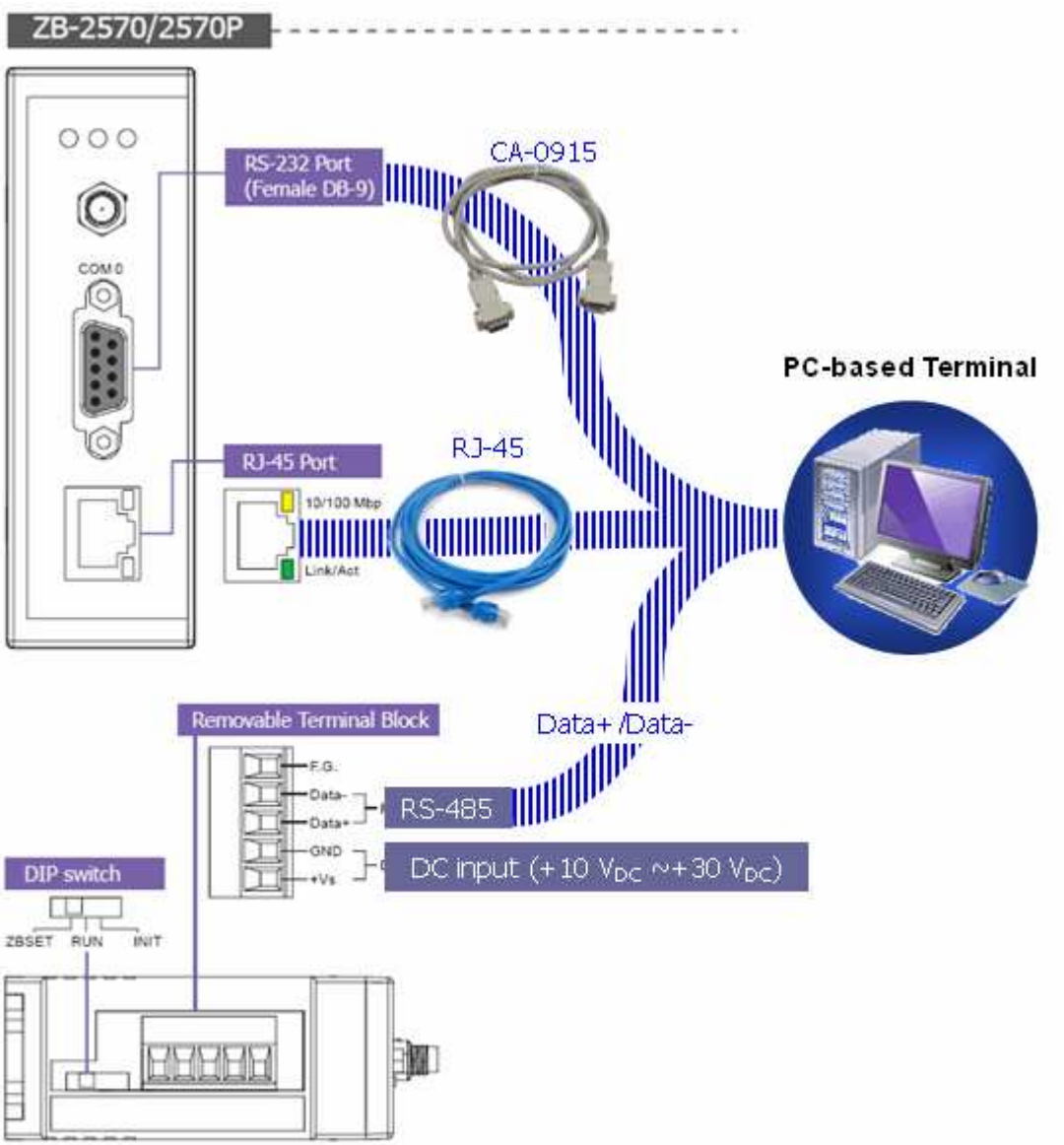


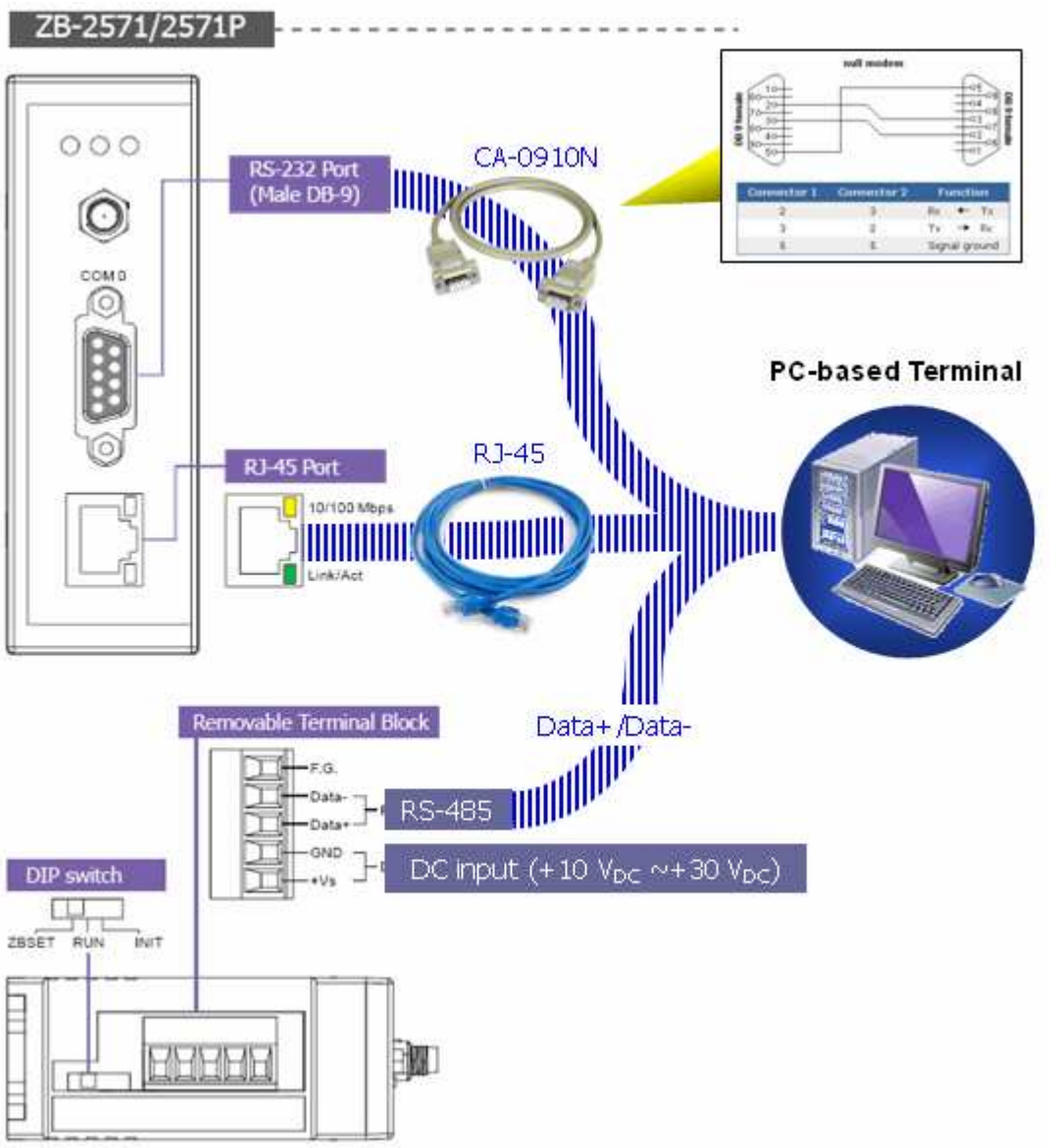
5.2 ZB-2570/2571/2570P/2571P Configuration Hardware

I. Adjust the switch to the **ZBSET** position then power on the module.



II. Configuring the serial port and ethernet hardware




ZB-2571/2571P
RS-232 Port
(Male DB-9)
CA-0910N
PC-based Terminal
RJ-45 Port
RJ-45
10/100 Mbps
Link/Act
Removable Terminal Block
Data+ /Data-
F.G.
Data-
Data+
GND
+Vs
RS-485
DC input (+10 VDC ~+30 VDC)
DIP switch
ZBSET
RUN
INIT

5.3 Quick Start for the ZigBee Converter

1. Before configuring the ZigBee converter, adjust the switch to the **ZBSET** position then switch on the power (**Figure 1**). After configuration is complete, adjust the switch to the **RUN** position then switch on the power (**Figure 2**). Be sure to turn the power off before adjusting the switch.

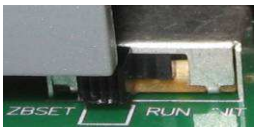
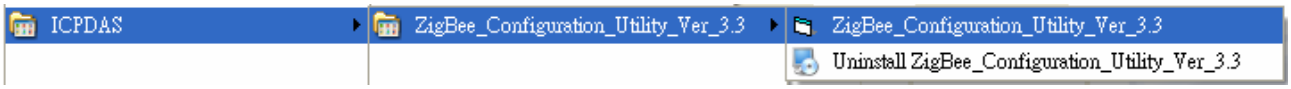


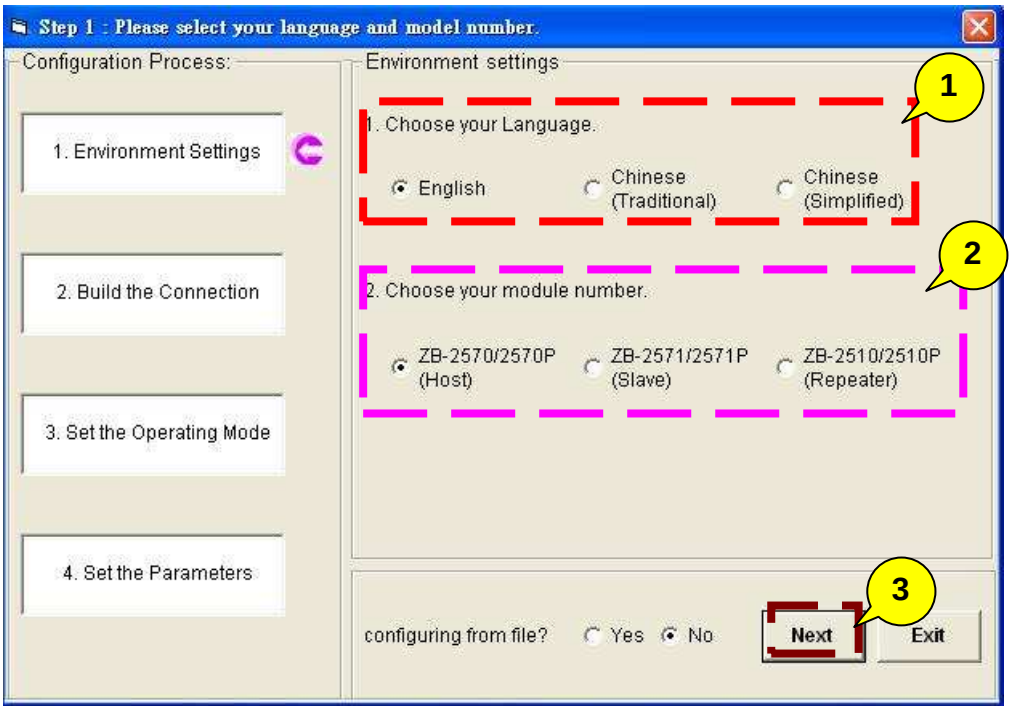
Figure 1

Figure 2

2. After installing the ZigBee_Configuration_Utility_Ver_3.3, the executable file can be found at: *Start\ProgramFiles\ICPDAS\ZigBee_Configuration_Utility_Ver_3.3\ZigBee_Configuration_Utility_Ver_3.3.exe*



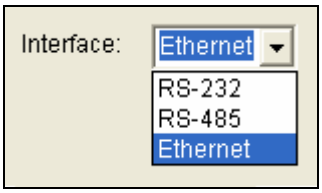
3. Connect the ZigBee converter using one of the hardware interfaces (RS-232, RS-485 or Ethernet; the default configuration interface is RS-232) and execute the utility.
4. When the following screen is displayed:
   In the *Environment Settings* section:
   1. Choose the language.
   2. Choose the module (ZB-2570/2571/2570P/2571P).
   3. Click the **Next** button.



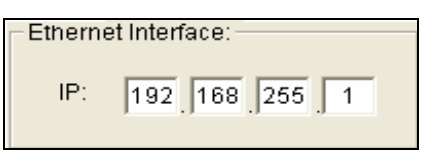
5. When the following screen is displayed:

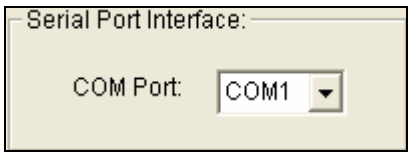
In the *Build the Connection* section:

1. Select the configuration interface of your ZigBee converter module.

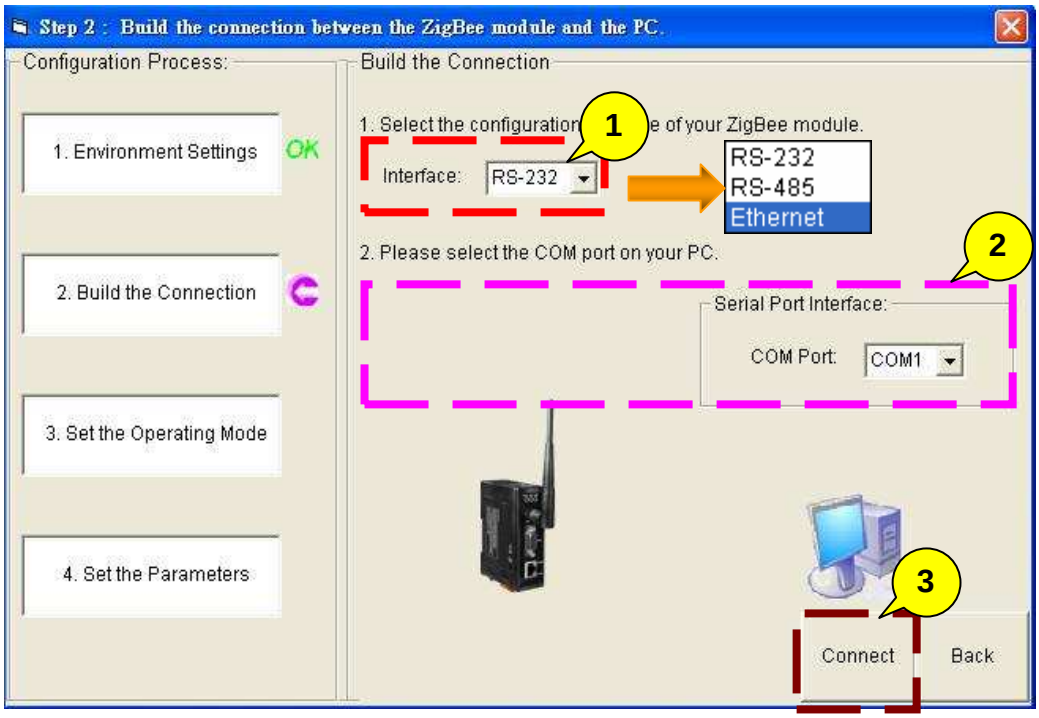


2. Enter the interface parameters (COM Port number or IP)





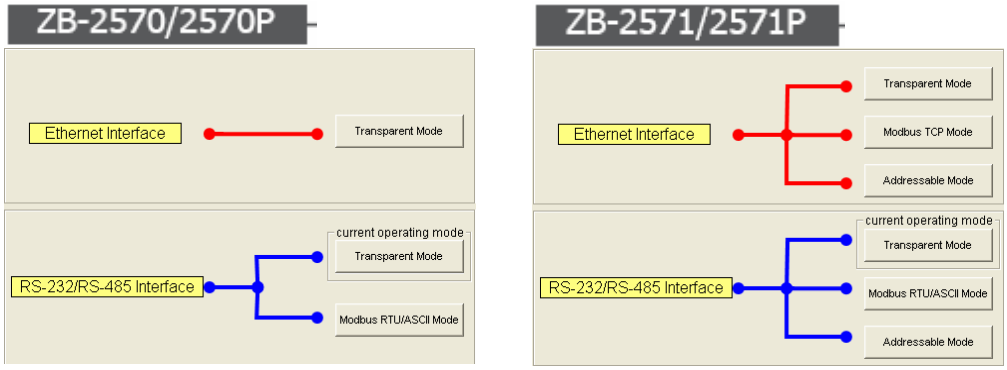
3. Click the **Connect** button.



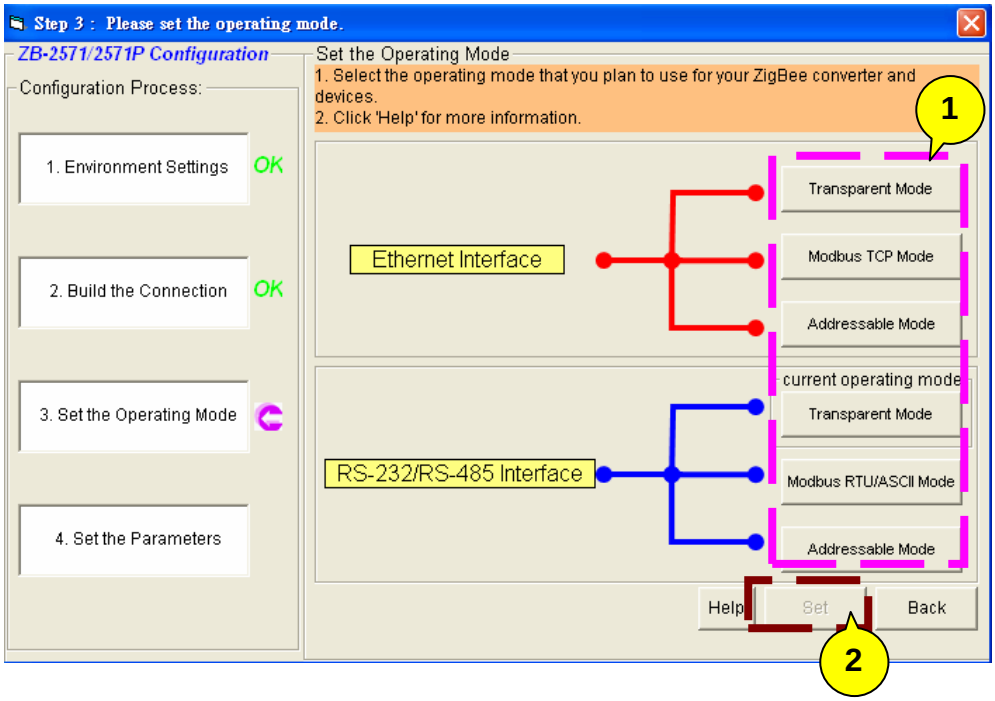
6. When the following screen is displayed:

   In the *Set the Operating Mode* section:

   1. Select the operating mode that you plan to use for your ZigBee converter and devices.



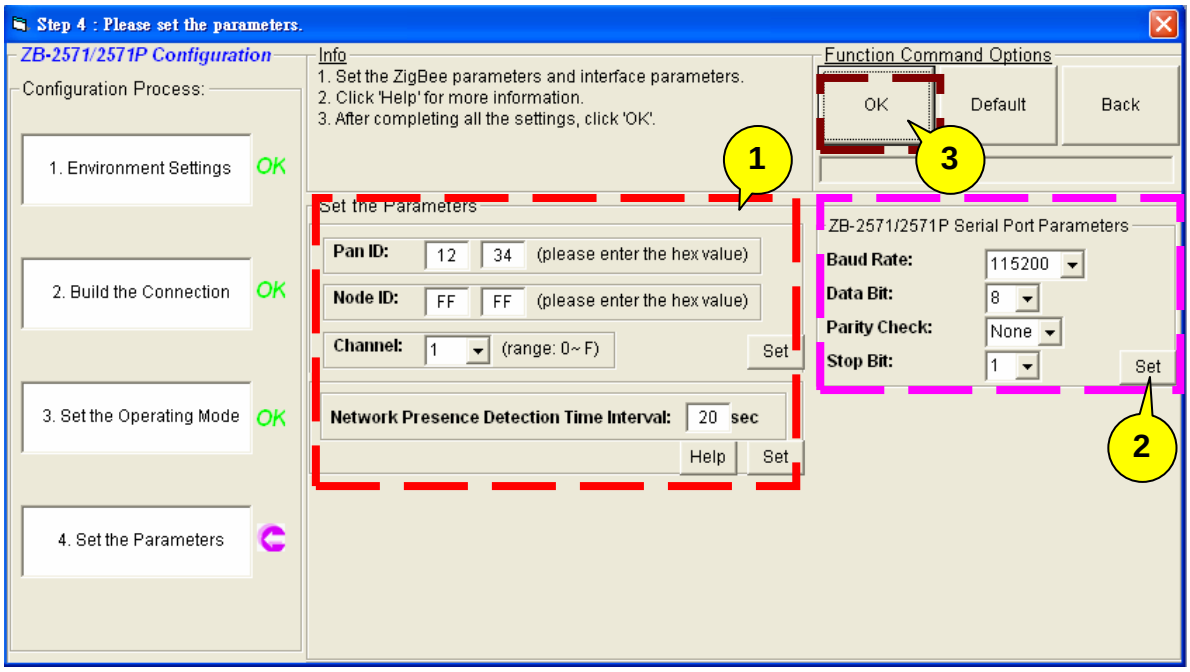
   2. Click the **Set** button.



7. When the following screen is displayed:

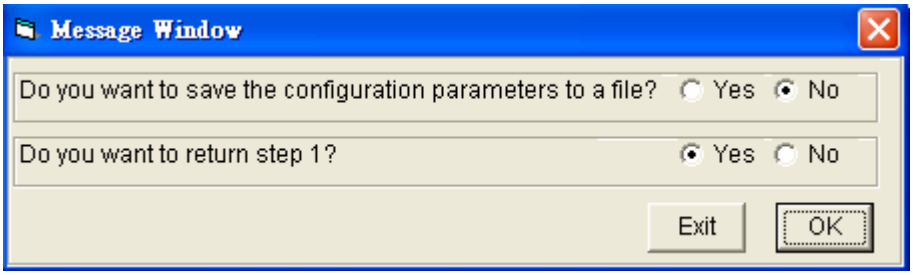
   In the *Set the Parameters* section:

   1. Set the ZigBee parameters. After entering the ZigBee parameter settings, click the **Set** button.
   2. Set the interface parameters, after finishing the interface parameter settings, click the **Set** button.
   3. Click the **OK** button.



When the following alert is displayed, it means that the configuration has been successful. Click the **OK** button to continue the configuration.

When the following alert is displayed, it means that configuration is finished. Click the **OK** button to exit the configuration.



5.4 Configure the Operating Mode

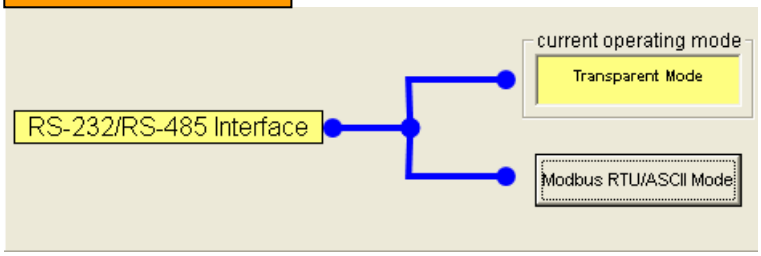
1. Serial Port Operating Mode 1 – Transparent Mode:

1. Operating Mode:

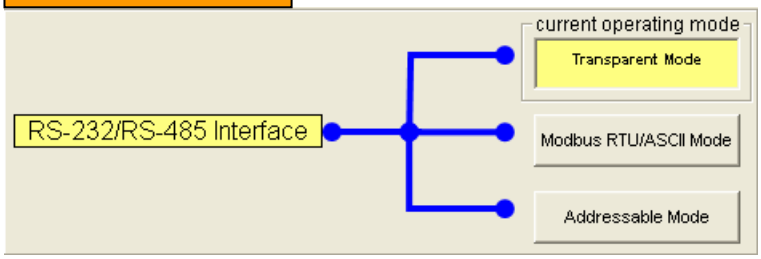
   ZB-2570/2570P: RS-232/RS-485 Interface – **Transparent Mode**

   ZB-2571/2571P: RS-232/RS-485 Interface – **Transparent Mode**

ZB-2570/2570P

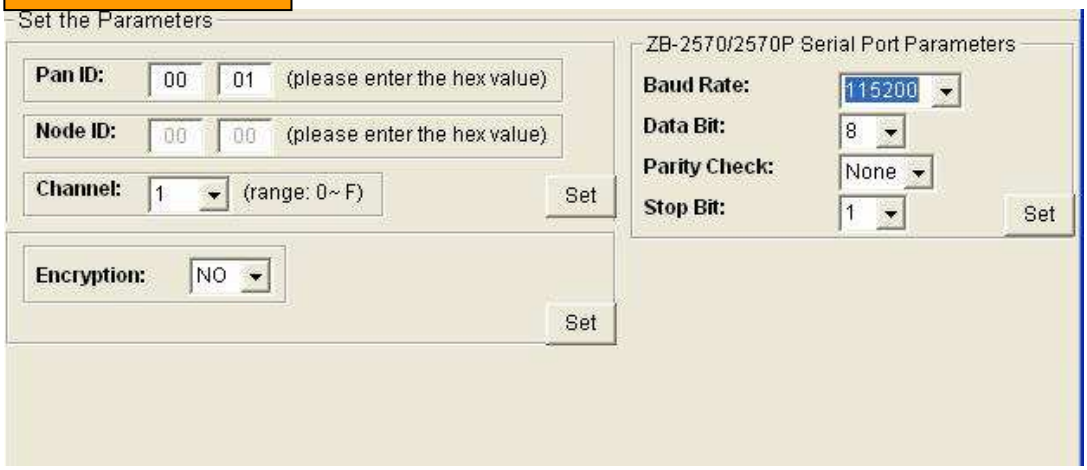


ZB-2571/2571P

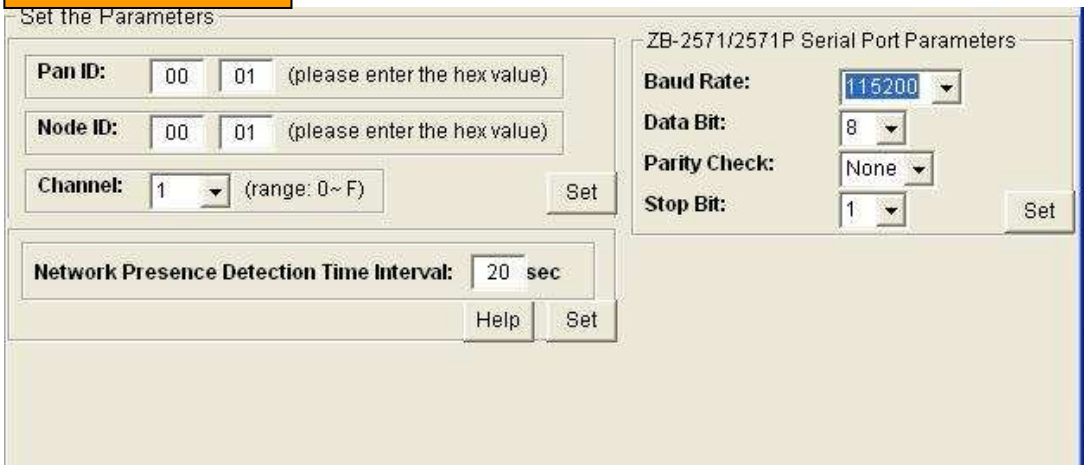


2. ZigBee Parameters: the **Pan ID** and the **Channel** must be the same as each other.
3. Interface Parameters: serial port (RS-232 or RS-485) parameters.

ZB-2570/2570P



ZB-2571/2571P



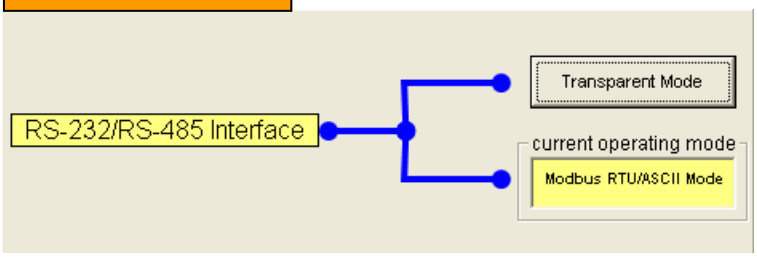
2. Serial Port Operating Mode 2 – Modbus RTU/ASCII Mode:

1. Operating Mode:

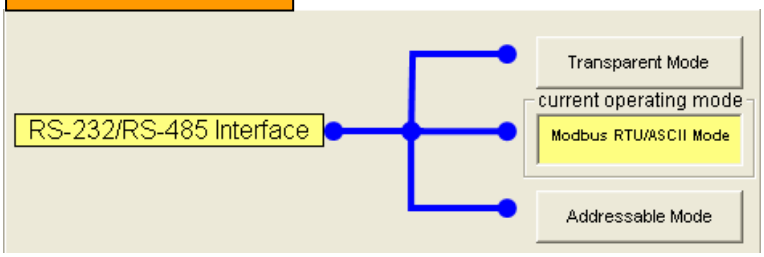
   ZB-2570/2570P: RS-232/RS-485 Interface – **Modbus RTU/ASCII Mode**

   ZB-2571/2571P: RS-232/RS-485 Interface – **Modbus RTU/ASCII Mode**

ZB-2570/2570P



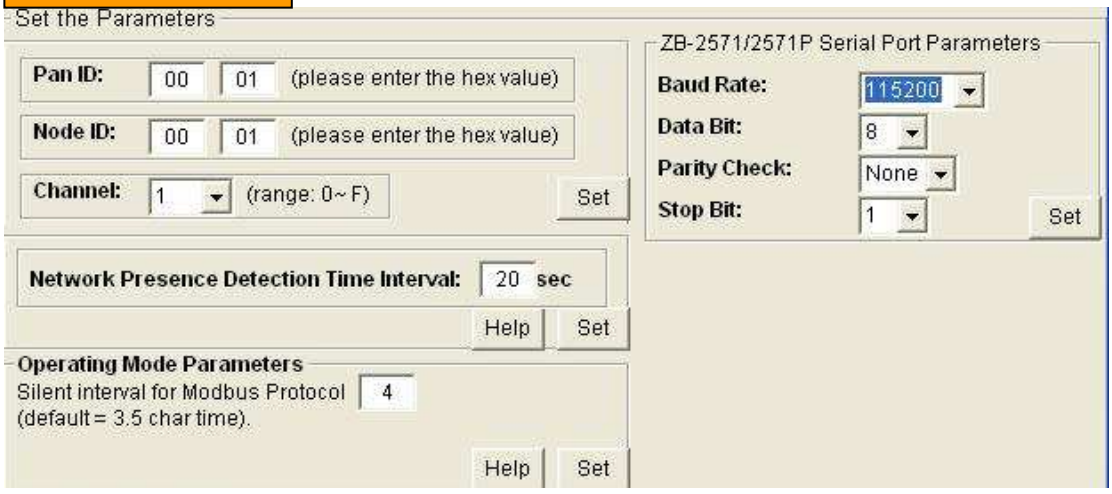
ZB-2571/2571P



2. ZigBee Parameters: the **Pan ID** and the **Channel** must be the same as each other.
3. Interface Parameters: serial port (RS-232 or RS-485) parameters.
4. Operating mode parameters: COM Port receive timeout value.

ZB-2570/2570P

ZB-2571/2571P



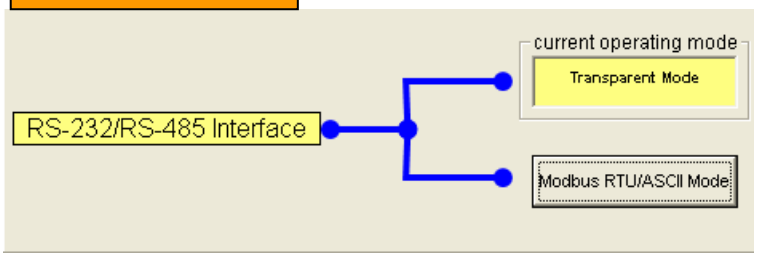
3. Serial Port Operating Mode 3 – Addressable Mode:

1. Operating Mode:

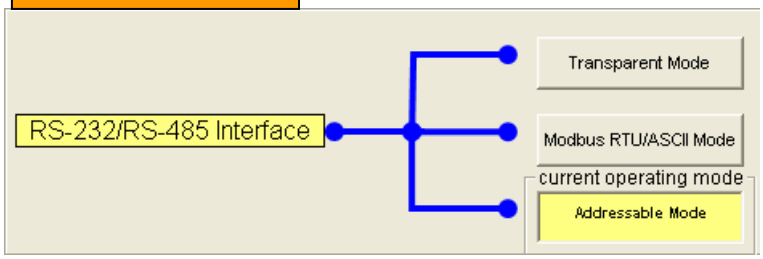
   ZB-2570/2570P: RS-232/RS-485 Interface – **Transparent Mode**

   ZB-2571/2571P: RS-232/RS-485 Interface – **Addressable Mode**

ZB-2570/2570P



ZB-2571/2571P



2. ZigBee Parameters: the **Pan ID** and the **Channel** must be the same as each other.
3. Interface Parameters: serial port (RS-232 or RS-485) parameters.
4. operating mode parameter: be equal to **Node ID**.

ZB-2570/2570P

ZB-2571/2571P

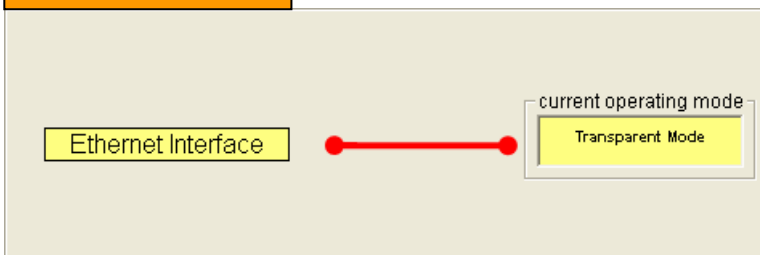
4. Ethernet Operating Mode 1 – Transparent Mode:

1. Operating Mode:

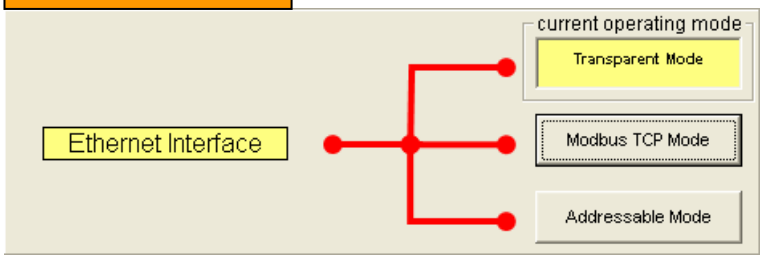
   ZB-2570/2570P: Ethernet Interface – **Transparent Mode**

   ZB-2571/2571P: Ethernet Interface – **Transparent Mode**

ZB-2570/2570P



ZB-2571/2571P



2. ZigBee Parameters: the **Pan ID** and the **Channel** must be the same as each other.
3. Interface Parameters: IP, Mask, Gateway, Port.

ZB-2570/2570P

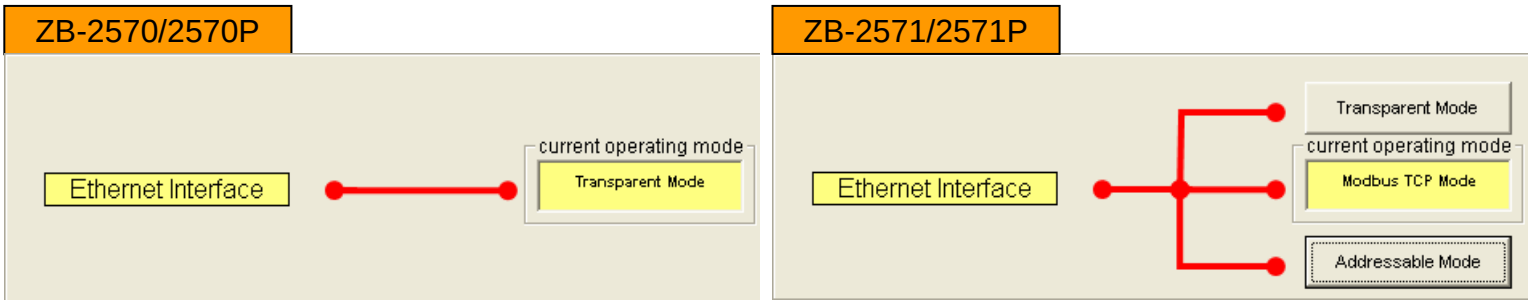
ZB-2571/2571P

5. Ethernet Operating Mode 2 – Modbus TCP Mode:

1. Operating Mode:

   ZB-2570/2570P: Ethernet Interface – **Transparent Mode**

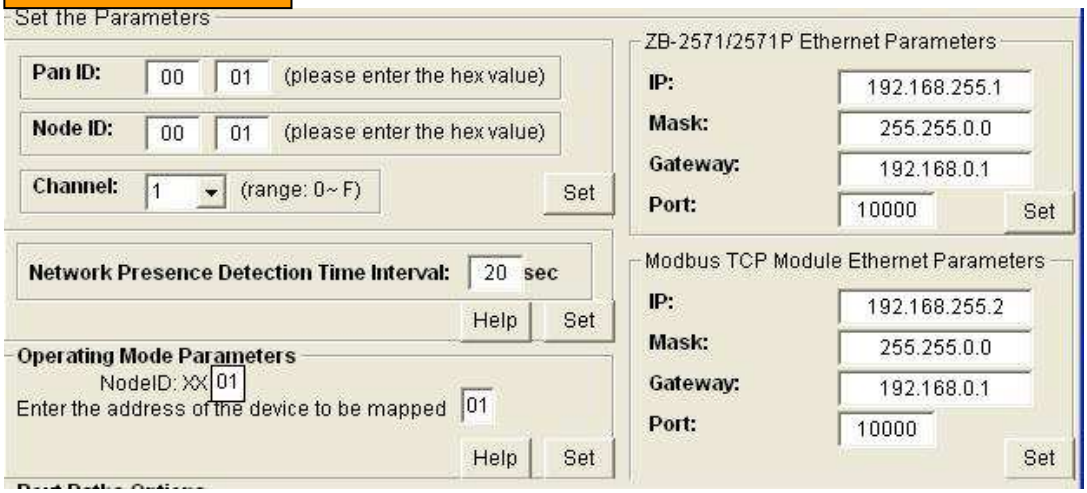
   ZB-2571/2571P: Ethernet Interface – **Modbus TCP Mode**



2. ZigBee Parameters: the **Pan ID** and the **Channel** must be the same as each other.
3. Interface Parameters: IP, Mask, Gateway, Port.
4. operating mode parameter: the mapping address and the modbus tcp device ethernet parameters.

ZB-2570P

ZB-2571P

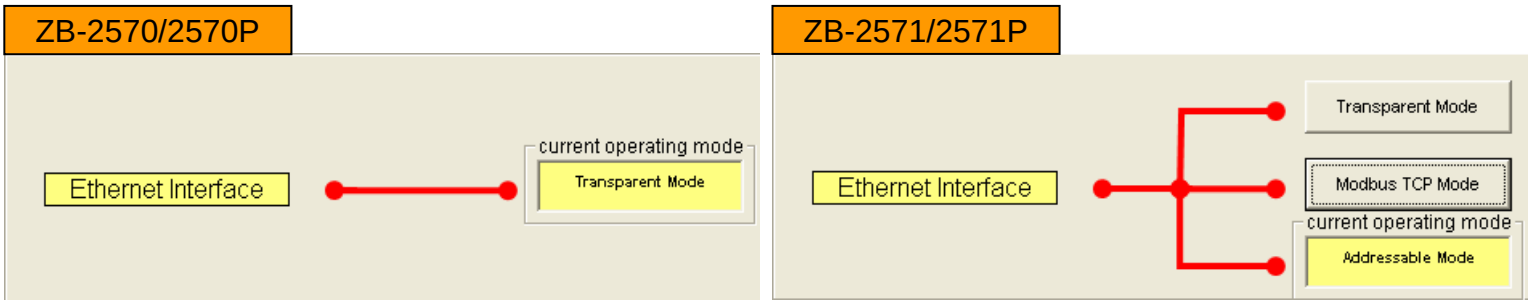


6. Ethernet Operating Mode 3 – Addressable Mode:

1. Operating Mode:

   ZB-2570/2570P: Ethernet Interface – **Transparent Mode**

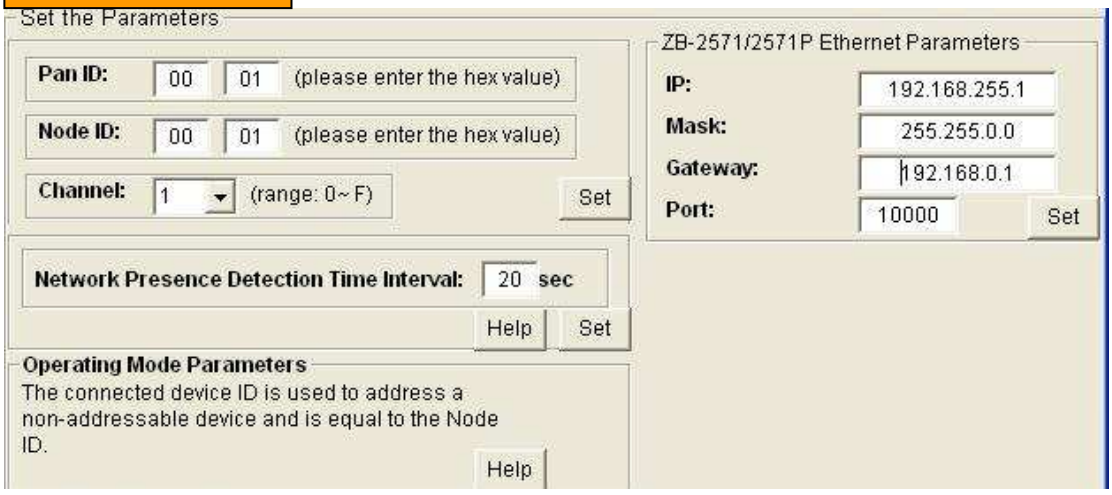
   ZB-2571/2571P: Ethernet Interface – **Addressable Mode**



2. ZigBee Parameters: the **Pan ID** and the **Channel** must be the same as each other.
3. Interface Parameters: IP, Mask, Gateway, Port.
4. Operating mode parameters: must be equal to **Node ID**.

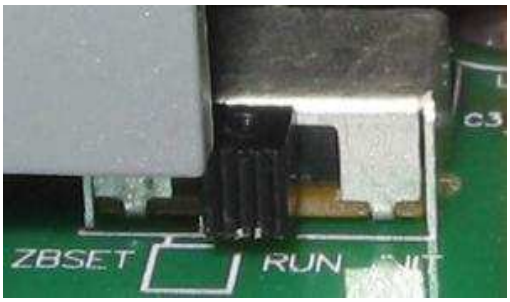
ZB-2570/2570P

ZB-2571/2571P

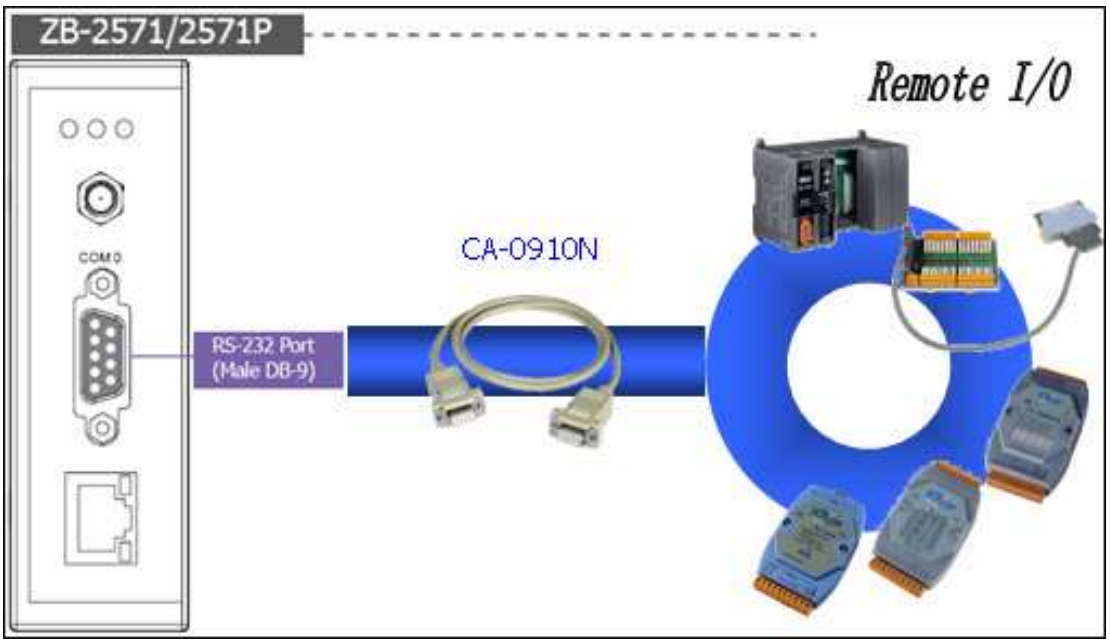


5.5 Installing the Hardware

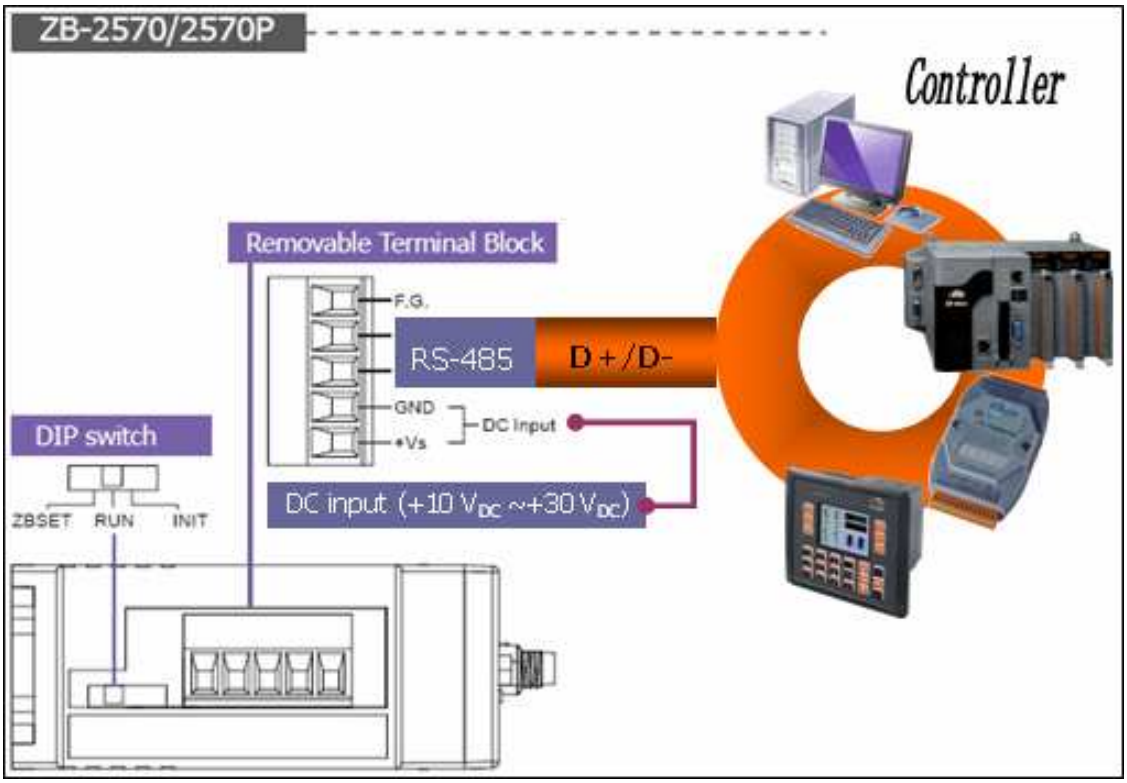
1. Adjust the switch to the **RUN** position then power on the module.

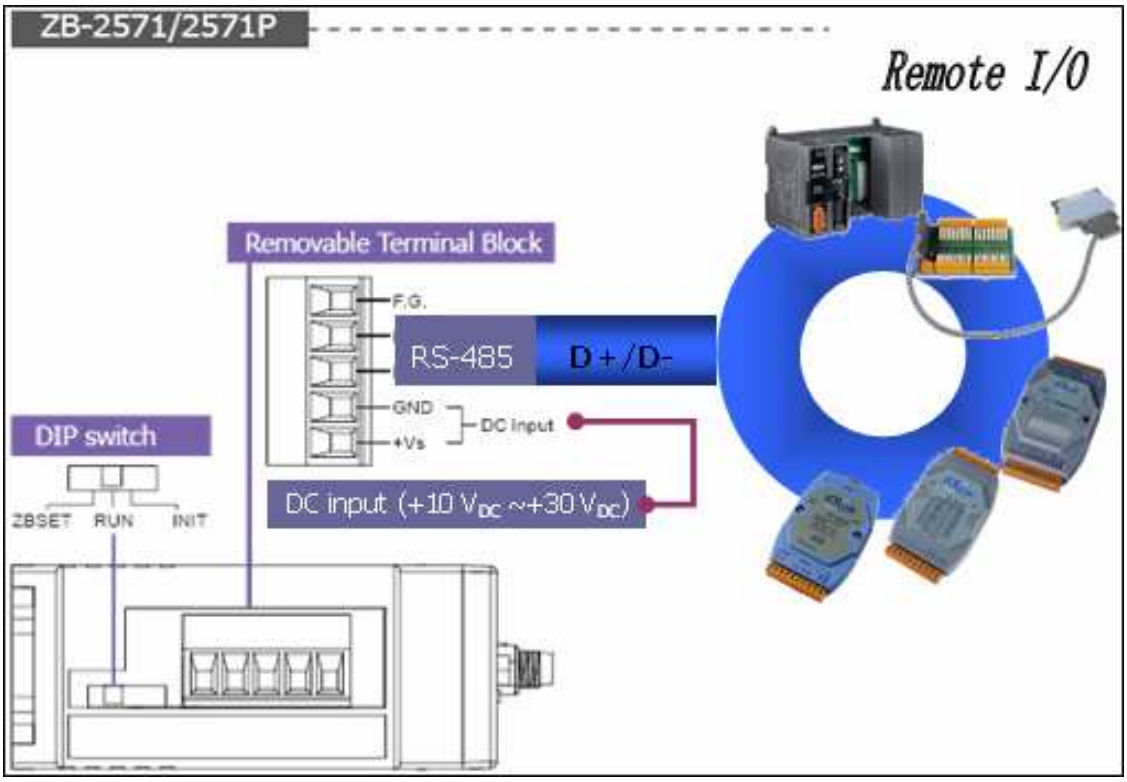


2. Serial Port - RS-232

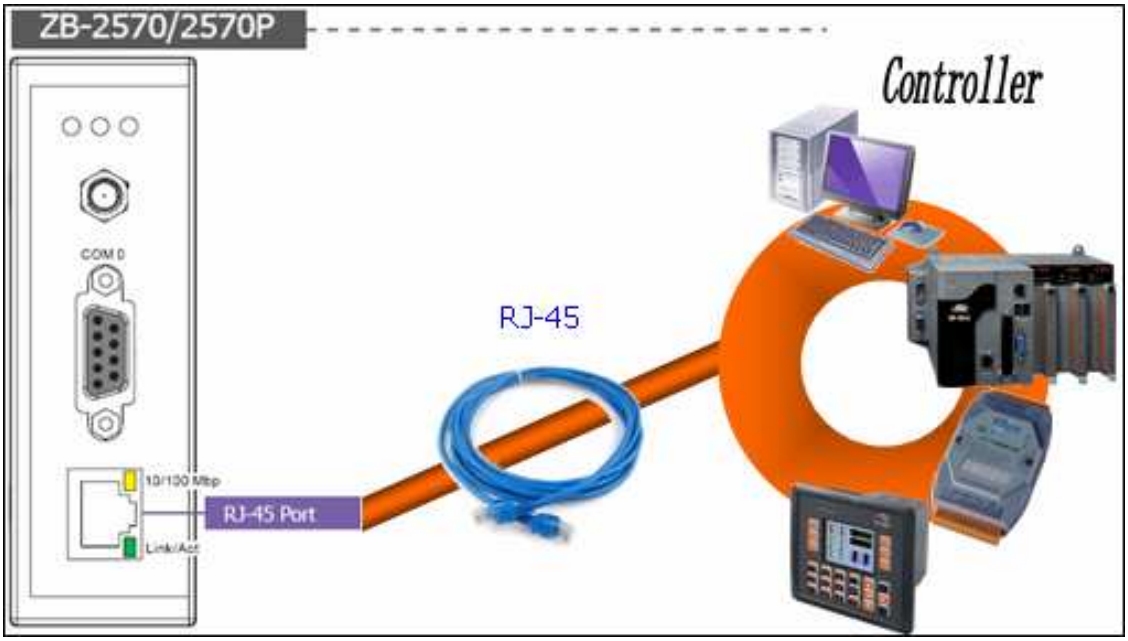


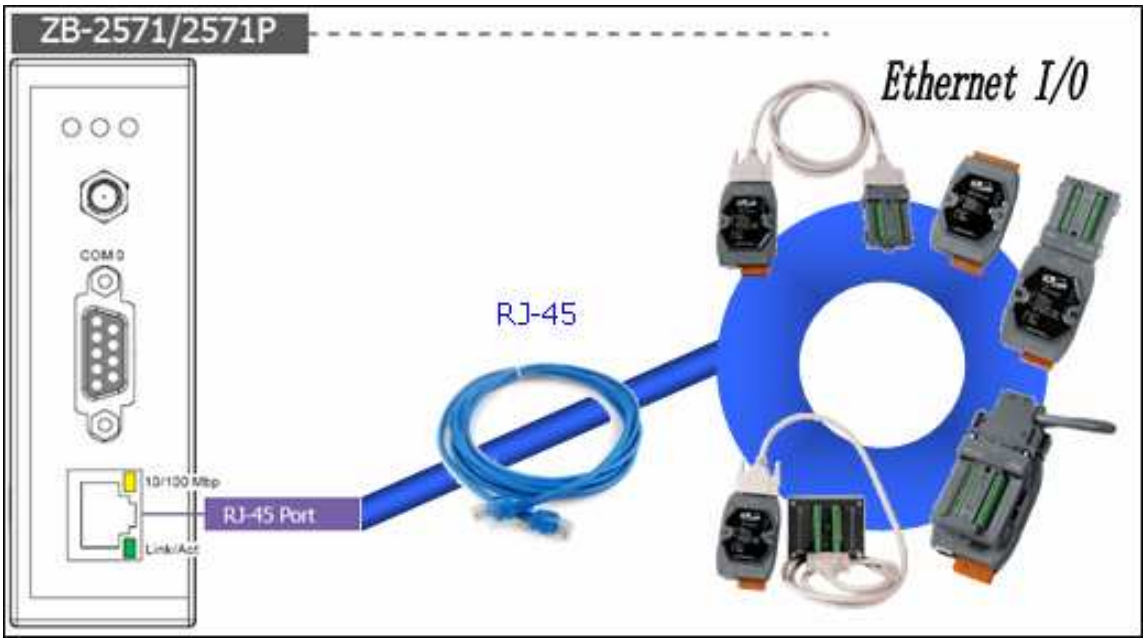
3. Serial Port - RS-485





4. Ethernet – RJ-45

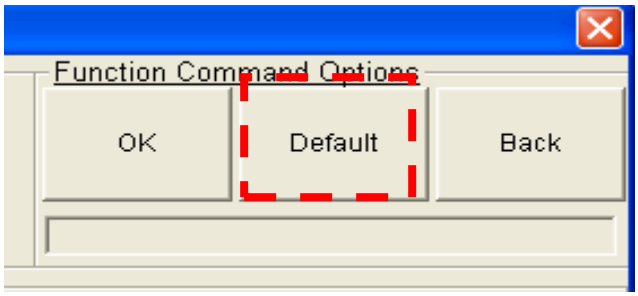




6. Appendix

6.1 Resetting parameters to default:

1. In the set parameters dialog box (page 23), click the **Default** button.



2. The ZB-2570/2570P default settings:

Pan ID		00 01
Node ID		00 00
RF Channel		1
Encryption		No
Operating Mode		Transparent Mode
Serial Port Interface settings		115200, N, 8, 1
Ethernet Interface settings	IP	192.168.255.1
	Mask	255.255.0.0
	Gateway	192.168.0.1
	Port	10000

3. The ZB-2571/2571P default settings:

Pan ID		00 01
Node ID		00 01
RF Channel		1
Network Presence Detection Time Interval		20 sec
Operating Mode		Transparent Mode
Serial Port Interface settings		115200, N, 8, 1
Ethernet Interface settings	IP	192.168.255.1
	Mask	255.255.0.0
	Gateway	192.168.0.1
	Port	10000

6.2 Included Cables:

Module	Cable	Description
ZB-2570/2570P	CA-0915	9-pin female D-sub and 3-wire RS-232 cable,1M Cable.
ZB-2571/2571P	CA-0910N	9-pin female-female D-sub cable, 1M Null Modem Cable.

6.3 Network Status Detection Time Setting:

If the setting value is 20, it means that every 20 seconds a packet will be sent to confirm the status of the network. If communication is disconnected, then self-recovery of the network will occur. If the value is set to 0, the mechanism will be turned off.

6.4 Setting Tool download location:

website:
http://ftp.icpdas.com/pub/cd/usbcd/napdos/zigbee/zigbee_converter/zb_257x/utility/
CD path:
\Napdos\ZigBee\ZigBee_Converter\ZB-257x\Utility\

6.5 Document download location:

website:
http://ftp.icpdas.com/pub/cd/usbcd/napdos/zigbee/zigbee_converter/zb_257x/document/
CD path:
\Napdos\ZigBee\ZigBee_Converter\ZB-257x\ Document \

6.6 ZigBee Products website:

http://www.icpdas.com/products/GSM_GPRS/wireless/solutions.htm#6

6.7 Technical Service:

If you have any questions, send a description of your problem to:
service@icpdas.com

7. Ordering Information

ZigBee Converter	
ZB-2570 CR	Ethernet/RS-485/RS-232 to ZigBee Converter (Host) (RoHS)
ZB-2570/S CR	Ethernet/RS-485/RS-232 to ZigBee Converter (Host) (RoHS)+ GPSU06U-6 (Power Supply)
ZB-2571 CR	Ethernet/RS-485/RS-232 to ZigBee Converter (Slave) (RoHS)
ZB-2571/S CR	Ethernet/RS-485/RS-232 to ZigBee Converter (Slave) (RoHS)+ GPSU06U-6 (Power Supply)
ZB-2570P CR	Ethernet/RS-485/RS-232 to High Power Amplifier ZigBee Converter (Host) (RoHS)
ZB-2570P/S CR	Ethernet/RS-485/RS-232 to High Power Amplifier ZigBee Converter (Host) (RoHS)+ GPSU06U-6 (Power Supply)
ZB-2571P CR	Ethernet/RS-485/RS-232 to High Power Amplifier ZigBee Converter (Slave) (RoHS)
ZB-2571P/S CR	Ethernet/RS-485/RS-232 to High Power Amplifier ZigBee Converter (Slave) (RoHS)+ GPSU06U-6 (Power Supply)

8. Accessories

ZigBee Converter	
ZB-2550 CR	RS-485/RS-232 to ZigBee Converter (Host) (RoHS)
ZB-2550/S CR	RS-485/RS-232 to ZigBee Converter (Host) (RoHS)+ GPSU06U-6 (Power Supply)
ZB-2551 CR	RS-485/RS-232 to ZigBee Converter (Slave) (RoHS)
ZB-2551/S CR	RS-485/RS-232 to ZigBee Converter (Slave) (RoHS)+ GPSU06U-6 (Power Supply)
ZB-2550P CR	RS-485/RS-232 to High Power Amplifier ZigBee Converter (Host) (RoHS)
ZB-2550P/S CR	RS-485/RS-232 to High Power Amplifier ZigBee Converter (Host) (RoHS)+ GPSU06U-6 (Power Supply)
ZB-2551P CR	RS-485/RS-232 to High Power Amplifier ZigBee Converter (Slave) (RoHS)
ZB-2551P/S CR	RS-485/RS-232 to High Power Amplifier ZigBee Converter (Slave) (RoHS)+ GPSU06U-6 (Power Supply)
ZigBee Repeater	
ZB-2510 CR	ZigBee Repeater (RoHS)
ZB-2510/S CR	ZigBee Repeater (RoHS) + GPSU06U-6 (Power Supply)
ZB-2510P CR	High Power Amplifier ZigBee Repeater (RoHS)
ZB-2510P/S CR	High Power Amplifier ZigBee Repeater (RoHS) + GPSU06U-6 (Power Supply)
ZigBee DIO	
ZB-2052 CR	Wireless 8-ch Isolated Digital Input Module with 16-bit Counters (RoHS)
ZB-2060 CR	Wireless 6-ch Isolated Digital Input and 4-ch Relay Output Module (RoHS)